OPERATIONAL DILEMMA OF VTOL

FLYING

THE WORLD'S MOST WIDELY READ AVIATION MAGAZINE

JANUARY

50¢

AIRLIFTS FOR PRIVATE BUSINESS

SPERRY — INDUSTRIAL GIANT OF THE AIR AGE

ARE THE BLIMPS THROUGH?

CHECK FLIGHTS:

BEECH BONANZA N35

PIPER COLT 108

DITCHING YOUR LANDPLANE

BEECH BONANZA N35

F-40-AV
UNIV MICROFILMS INC
ATTN-MRS P M COLLING
313 N 1ST ST
ANN ARBOR MICH

Slam it on water!
Soar to the sky!
Land "hands off"!

THREE WAYS...

LAKE IS AMERICA'S "UNBELIEVABLE" PLANE

Pick up the challenge! Fly the new Lake 4-Place Amphibian – you'll believe what you thought couldn't be true!

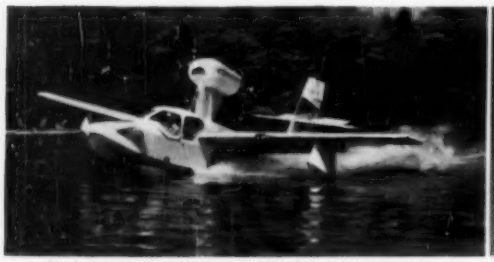
Let's face it. Anybody can tell you the good things he wants you to believe about his product. Only Lake offers you three *unbelievable* benefits which make acceptance of America's only single-engined amphibian one of the most talked-of events in business-aviation history.

Lake is built like a battleship. From true-boat hull to straight-through spar (and in a hundred other ways you can't see), Lake is built to take the punishment of rough water handling. But *it outperforms many land planes.*

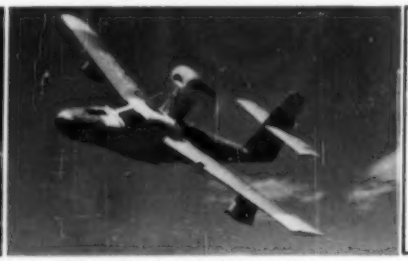
Lake takes off on a dime. It climbs like a fighter. It glides like a glider. It really soars! Yet *it has heft and stability to shrug off water take-off, water landings, which no land plane ever has to take.*

Lake says: "Glad to have you at the controls!" Land "hands off" on water! Lake is one of the easiest planes to fly ever made. Check out with a factory-trained flight instructor and *you'll be at home on land and water in a Lake . . . in a week or less!*

Want to believe it? Fly it! Lake takes you more places on land *and* water, and safely brings you back again, than any land *or* water plane can do . . . to more than earn its keep for you. Write for complete description. Or phone or wire for name of your nearest Lake Dealer, *today!*



Lake is built like a battleship, to take the punishment of rough water landings



The agile Lake takes to the air as if it had its home up there

Buy new or used! . . .

FREE

amphibious flight instruction is available to every new Lake owner.

Lake
AIRCRAFT CORP.

No other plane . . .
looks . . . flies . . .
like the Lake

MANUFACTURERS of the Lake LA-4
Sales Office: Grenier Field, Manchester, N. H.
(44 miles from Boston)
Telephone: Area Code 603 NA 5-8961

Want to expand in aircraft? Dealer franchises are open in selected areas, both in the United States and abroad.

NEW *for single engine aircraft*

IN-501A INDICATOR. Luminous dial, large easy-to-read characters

R-501A RECEIVER. Panel-mounted, highly sensitive, light weight

A Compact, Highly Sensitive Local Control ADF System

In its new 501A ADF System, ARC presents a whole new dimension in performance and economy for single engine aircraft. Offering service and dependability that more than meet your flying requirements, it is light in weight, low in cost, simple and easy to install.

COMPACT DESIGN SAVES SPACE, REDUCES WEIGHT

ARC's new 501A System is designed to operate from the primary aircraft power supply. No separate power unit or rotating machinery is required. Current drain is reduced, efficiency is improved. Valuable space is saved, and weight reduced.

The heart of the system is its highly sensitive, panel-mounted, complete receiver, which includes the tuning meter. The large indicator dial covers a full 360°, providing greater tuning ease and readability. Using both transistors and vacuum tubes for optimum efficiency over wide temperature ranges, the 501A's receiver will operate dependably in the most severe environmental conditions which may be encountered in the aircraft's cabin.

The entire 501A System, excluding cables, weighs 14.2 pounds, with its slim, electrically compensated loop, low-weight amplifier unit, and luminous easy-to-read indicator.

EASY TO INSTALL

Multi-color coded cables simplify and speed installation. An installation kit provides everything you need. There are no complicated drawings or numbers to puzzle you.

For the budget minded aircraft owner, who insists on quality and performance, there is no better ADF System than ARC's 501A! See it at your ARC dealer's now! $950.00 plus installation

Starflite III

ARC ADF

MODEL 501A

■ Write today for illustrated brochure giving complete details and specifications of the ARC 501A ADF System.

ARC Starflite III

Aircraft Radio Corporation

BOONTON, NEW JERSEY

RESEARCH, DESIGN, DEVELOPMENT AND PRODUCTION OF ELECTRONIC EQUIPMENT SINCE 1928

NEW SYMBOL OF RELIABILITY. The new ARC Starflite emblem on the COM/NAV equipment you select is your assurance of the ultimate in reliability. Every ARC Starflite product, whether designed for compact economy planes, or larger aircraft, is unmatched in craftsmanship and performance.

FLYING®

JANUARY, 1961
VOLUME 68, NUMBER 1

COVER: Beech's new and improved N35 Bonanza is the subject of the check pilot report on page 40. Range with the fuel-injected 260-hp Continental 1,215 miles, at 45% power and 10,000 feet, or 1,090 miles at 65%. Speed 200 mph plus. James Yarnell photo.

CONTENTS

EDITORIAL — 30 — *Gill Robb Wilson*
Five miles high in a jetliner—reflections about our national heritage

THE FUTURE OF VTOL AIRCRAFT — 32 — *J. S. Butz Jr.*
Analysis of current research aircraft points up operational dilemma

ARE THE BLIMPS THROUGH? — 36 — *Lou Davis*
An objective report on the future capabilities of lighter-than-air craft

AIRMAN'S WORLD — 38 — *Gill Robb Wilson*
"You're on your own": four short words the student will never forget

CHECK PILOT REPORT: BONANZA N35 — 40 — *Norman Jacobshagen*
Increased power and useful load are among new features of the 1961 model

GULFSTREAM BY ATLANTIC — 42 — *Gerald J. Schlaeger*
Distributor's package-program includes special instrumentation, interior

AIRLIFTS FOR PRIVATE INDUSTRY — 44 — *Louis Alexander*
Charter flights assume growing importance throughout the business world

SPERRY, INDUSTRIAL GIANT OF THE AIR AGE — 46 — *Gill Robb Wilson*
The wide range of achievements by one of aviation's major contributors

CHECK PILOT REPORT: PIPER COLT 108 — 49 — *Gerald J. Schlaeger*
Flight evaluation of low-cost two-seater, latest addition to the line

DITCHING YOUR LANDPLANE — 50 — *David M. Hume*
Emergency principles to follow when faced with a forced landing at sea

BRANTLY'S B-2 HELICOPTER — 52 — *A. C. Bass*
A close look at one of the nation's most compact low-cost rotorcraft

LEADING LADIES OF AVIATION — 54 — *James H. Winchester*
Personalities whose achievements contributed to aeronautical progress

EXECUTIVE HELICOPTER PILOT — 56 — *Frank J. Delear*
A variety of assignments for the dean of company rotary-wing pilots

WORLD'S NORTHERNMOST AIRLINE — 58 — *Cal Floyd*
Scheduled air service has a dramatic effect on life in rugged Arctic land

THE PRO'S NEST: RADIO NAVIGATION — 60 — *Ted Durosko*
Achieving an instrument rating—how to set up an effective study program

SURVIVAL IN THE OPEN — 62 — *John T. Flynn, M.D.*
These useful facts will keep you alive when stranded by a forced landing

AMARILLO'S TRADEWIND AIRPORT — 63 — *Don Downie*
The emphasis is on good customer service—how this airfield achieves it

A LIEUTENANT NAMED CHRISTIAN — 66 — *Richard Bach*
The need for more fire-and-brimstone instructors, Air Force style

FLYING FEATURES

Mailbox 4
Briefings 8
Who and Where 10
New Products 10
Have You Read? 27
Picture Credits 92
Flying Newsreel 64
I Learned About Flying From That 68
Flying Calendar 76
Thrust Lever 92
Hangar Flying 105
Advertising Index 105

IN THIS ISSUE of FLYING, as usual, several features point up aviation safety. Most appropriate, however, is the story on ditching. We, too, recently did some overwater flying: to the Bahamas for the Piper Colt evaluation and also over the ocean in relation to our Navy blimp report. Yes, we first read the initial proofs of the page 50 feature.

GILL ROBB WILSON
Publisher

ROBERT B. PARKE
Assistant Publisher

ROBERT I. STANFIELD
Editor

ALEX DAWYDOFF
Managing Editor

NOVETAH DAVENPORT
Associate Editor

RICHARD B. WEEGHMAN
Associate Editor

A. M. COURTNEY
Editorial Assistant

A. C. BASS
LOU DAVIS
GERALD J. SCHLAEGER
Contributing Editors

FIL GIULIANO
Art Director

WILLIAM J. WINTER
Production Director

Advertising Staff

DANIEL C. MINNICK
Advertising Manager

J. GORDON BENNETT
Eastern Advertising Representative

JOHN L. FILSON
Midwestern Advertising Manager

JAMES H. CASH
Southwestern Advertising Representative

ADRIAN WHITED
Western Advertising Manager

Member of the Audit Bureau of Circulations

Ziff-Davis Publishing Company Editorial and Executive Offices
One Park Avenue, New York 16
Branch Offices: 434 South Wabash Ave. Chicago 5, Ill.
9025 Wilshire Blvd. Beverly Hills, California.

WINGS and THINGS

MOONEY AIRCRAFT'S new Mark 21, four-place single-engine successor to the Mark 20A, will feature extensive design changes; major feature will be all-metal construction. Previously, the 20A's laminar-flow wing and empennage were constructed of pressure-bonded, laminated, aircraft spruce. Powerplant will remain the Lycoming 0-360 of 180 hp. Performance also will remain unchanged, due to wrap-around skin on wings.

NEW FOUR-PLACE *all-metal, low-wing aircraft will be made available by Beech Aircraft within the year. Cost will approximate $10,000. This will be followed by a low-cost two-place model. Beech also expects to fit Canadian P&W's PT-6 turboprop to its Queen Air for testing. Company's line of personal-business aircraft eventually will range from $5,000 to $350,000. Latest and eighth addition, the light-twin Model 55 Baron, will gross 4,880 lbs. and carry a useful load of 1,920 lbs. Five-place Baron will cruise at 216 mph at 65 per cent power; engines are Continental 10-470-L (fuel injection) of 260 hp each. Basic cost is $58,250.*

BELL HELICOPTER could be the first to fly the new family of turbines; two of its 47Js are being fitted with the light-weight (128 lbs.) Allison 250-C2 turboshaft rated at 250 shp at 6,022 rpm. Test-bed helicopters are being built under Navy contract for mid-year delivery. Empty weight is 1,350 lbs.; maximum gross, 2,850 lbs. Useful load, 1,350 lbs. Specs call for 60-gal. fuel capacity (JP-4); service ceiling of 18,000 ft.; hovering ceiling of 13,900 ft. (IGE) and 9,400 ft. (OGE); maximum speed of 105 mph.

LATERALIZER, *single-axis autopilot developed by Griswold Aeronautical Corp., Groton, Conn., has been granted the STC for use in the Beech Bonanza and the Cessna single-engine line up to Model 210. Unit does not use the common gyroscopic principle; works on detecting pressure differential from two orifices located on the underside of the wings. Sliding valve, connected by tubes to the orifices, meters vacuum to servos attached to aileron controls. Also available will be a yaw control unit operating through the DG, and Omni Lock. Price of single-axis Lateralizer is $395.*

INSTRUMENT PANEL design for single-engine aircraft and light twins under discussion between industry and Federal Aviation Agency. With ever-growing traffic density problem, more and better navigational equipment becomes necessary. As room on instrument panels of smaller aircraft is limited, the round-face, clock-like gauges may eventually cede to compact instruments for space availability and instantaneous reading. Some instruments, especially those indicating vertical displacement rates, may assume vertical configuration. One proposal is to have all indications in green when everything goes well, turning to red in the event of trouble.

WORLD'S FAIR *heliport proposals, as discussed by the Port of N. Y. Authority, have been opposed by the transportation segment of the 1964-65 event. Objections have been raised to the World's Fair Executive Committee to disallow any commercial helicopter operation in the fair grounds area.*

ZIFF-DAVIS PUBLISHING COMPANY. One Park Avenue, New York 16, N. Y. William B. Ziff, Chairman of the Board (1946-1953); William Ziff, President; W. Bradford Briggs, Executive Vice President; Michael Michaelson, Vice President and Circulation Director; Hershel B. Sarbin, Vice President; Charles Housman, Financial Vice President; Richard Kislik, Treasurer.

CONTRIBUTIONS: Contributions should be mailed to the New York Editorial Office at One Park Avenue, New York 16, N. Y., and must be accompanied by return postage. Contributors are advised to retain a copy of their manuscripts and illustrations. Contributions will be handled with reasonable care; but the magazine assumes no responsibility for their safety. Any copy accepted is subject to whatever adaptations and revisions are necessary to meet the requirements of this publication. Payment covers all author's, contributor's and contestant's rights, title and interest in and to the material accepted and will be made at our current rates upon acceptance. All photos and drawings will be considered as part of the material purchased.

SUBSCRIPTION SERVICE: All subscription correspondence should be addressed to Circulation Dept., 434 South Wabash Ave., Chicago 5, Ill. Please allow at least four weeks for change of address. Include your old address as well as new—enclosing, if possible, an address label from a recent issue.

SUBSCRIPTION RATES: One year U. S. and possessions and Canada $5.00; Pan American Countries $5.50; all other foreign countries $6.00.

FLYING is published monthly by the Ziff-Davis Publishing Company, William B. Ziff, Chairman of the board (1946-1953), at 434 South Wabash Ave., Chicago 5, Ill. Second-class postage paid at Chicago, Ill. Authorized by Post Office Department, Ottawa, Canada, as second-class matter.

Copyright © 1960 by Ziff-Davis Publishing Company. All rights reserved.

SAVE TWO PRECIOUS YEARS

12 ~~X~~ 4 ~~X~~

ENROLL NOW IN NORTHROP INSTITUTE'S TWO-YEAR COURSES IN:

Aeronautical Engineering Technology
Astronautical Engineering Technology
Electronic Engineering Technology
Mechanical Engineering Technology

Thousands of Northrop graduates have used their NIT education to qualify for fine positions in the Aircraft, Electronic, Space Technology, and general mechanical industries.

EARN A BACHELOR OF SCIENCE DEGREE

If you elect, you may continue your studies at Northrop Institute and earn a BS Degree in the field of your choice.

TIME IS MONEY

The time you save by training at Northrop will be worth literally thousands of dollars to you in dollars saved and extra money earned.

Northrop Institute of Technology

A privately-endowed, non-profit College of Engineering

1119 W. Arbor Vitae Street, Inglewood 1, California

MAIL COUPON FOR COMPLETE INFORMATION

NORTHROP INSTITUTE OF TECHNOLOGY
1119 W. Arbor Vitae Street, Inglewood 1, Calif.

Please send me immediately the Northrop Catalog. I am interested in a career in the field of:

- ☐ Aeronautical & Astronautical Engineering
- ☐ Electronic Engineering
- ☐ Mechanical Engineering
- ☐ Aircraft Maintenance Engineering
- ☐ Airframe & Powerplant Maintenance
- ☐ Jet Engine Maintenance

Name ..... Age ...

Address .....

City ..... Zone ... State .....

Veterans: Check here ☐ for special information.

MAILBOX

A MISCONCEPTION

Your ably written article "NAFEC, Testbed for Tomorrow," Part 1 (November FLYING) effectively describes in valuably condensed form the efforts of NAFEC in ATC automation. We would appreciate a chance to correct some misconceptions implied by Mr. Gubitz' article and by the caption of the photo of the REGAL antenna system.

It is true that the system operates on an air-derived basis as does ILS, but unlike ILS, REGAL does not provide a single 2½-degree glidepath to which all aircraft must conform. Rather, it sets up a field of position-data coordinates in which any aircraft equipped with a REGAL receiver can establish its own optimum glidepath at any glideslope from less than one degree up to 20 degrees. The "scissoring action" of the dual antenna has nothing to do with elevation control accuracy; the two antennas are energized alternately to double the rate at which elevation information is renewed in the aircraft.

We appreciate and second your writer's very realistic assessment of the great difficulties inherent in achieving an operational automatic landing system.

A. G. VAN ALSTYNE
Gilfillan Bros, Inc.,
Los Angeles, Calif.

NEGATIVE APPROACH

I think a company catering to the aviation trade who uses Hollywood-type, half-cocked scare copy to sell its equipment in an aviation publication such as FLYING magazine, which is trying to do a constructive job for general aviation, should be severely censured.

I refer to the advertisement of a west coast mail-order radio manufacturer in the November issue of FLYING for a home VHF receiver.

Excerpts: "Hear what pilots say . . . when the weather is bad, and there is fog, snow, or even icing conditions. Can you imagine what a pilot feels and thinks? Listen to him anxiously call the tower for assistance. . . . Hear planes in distress. Know what the specialists on the ground are doing to help."

This same company tries to sell airborne equipment to plane owners. If they'd use constructive selling copy they'd probably have more airplane owners to sell to.

WILLIAM D. STROHMEIER
Darien, Conn.

THE CASE FOR TWO UNIONS IN THE COCKPIT

In the November issue of FLYING there was an article by Captain Dave Kuhn of TWA which, while it had many valid points, also contained several statements which the Flight Engineers' International Association feels were not quite right. We would like to set the record straight.

First of all, on the issue of one union in the cockpit, Captain Kuhn says "there can be no real harmony on the flight deck" until a merger is accomplished. The flight engineers dispute this statement completely. All that is needed is mutual respect and recognition of the flight engineer by the ALPA leaders. If such respect and recognition on the part of ALPA leaders were present, why would it be necessary to have one union? We doubt if Captain Kuhn can point to any real dissension in today's cockpits or prove the charges he has made in this regard. We challenge Captain Kuhn to verify the charge that an engineer has ever "drawn a chalk line" on the floor of the cockpit to define his "jurisdiction." Sure, flight engineers have walked off the aircraft and some captains have refused to fly with certain flight engineers. But I can guarantee that there has been more bitterness and acrimony between certain captains and co-

(Continued on page 6)

WELCOME ABOARD

We here in St. Petersburg are justly proud of our Albert Whitted Municipal Airport and would like to climb aboard the "close-in" bandwagon (Mailbox September '60). We will let the photo make any claims as to whether or not it is the "closest."

Albert Whitted is an excellent general aviation airport with complete facilities and it also accommodates the U. S. Coast Guard Air Station. Joint use of the field by Civil Aviation and the Coast Guard for many years has been without conflict or complication. Despite its strategic downtown location, Albert Whitted is not a hemmed-in airport. Four of the six approaches to the three runways are unobstructed.

JOE ESSER, Treasurer
St. Petersburg (Fla.) Aviation Assn.

YOU ASKED FOR IT...HERE IT IS!

THE NARCO ADF-29 AUTOMATIC DIRECTION FINDER

With Revolutionary New Narcomatic Sensor...
Discards Old-Fashioned, Static-Prone, Null-Seeking System...
Operates on Strongest Signal...All-Transistorized...
Draws Only Half an AMP...Weighs Only 8 Pounds...Available NOW!

"Why not a Narco ADF?" For years that question has been asked by the tens of thousands of private and professional pilots and plane owners who have learned to respect and trust Narco Omni and VHF communications equipment. Narco's answer has always been "Not until a new and better design concept for ADF's can be found." Now, after years of steady research, that time has arrived. Narco has an ADF—the incomparable ADF-29—developed and designed by the same Narco people who made safe, reliable, accurate Omni available at practical cost for the vast majority of private pilots and plane owners.

"Just another ADF" was not good enough in the minds of Narco engineers and management—a group made up mostly of seasoned pilots fully aware of the navigation ease offered by a needle that pointed to and brought you to any radio range or homer, marine beacon or standard broadcast station.

Narco's ADF development project was started five years ago with these basic concepts and design goals:

1. **There must be a way to derive direction information from the strongest station signal, not the weakest. Present-day (pre-Narco) ADF's get their information from nothing—that is, home on the null or minimum signal, easily get distracted by extraneous signals such as static and, especially, thunderstorms.**
2. **There must be a way to eliminate the rotating, null-seeking or gonio loop, kept at right angles to the station by costly, delicate, on-off electro-mechanical systems.**
3. **There must be a simpler way to translate direction sensing information to needle indication in front of the pilot.**
4. **There must be a way to substantially reduce weight and electrical power loads, both becoming critical problems in modern, well-equipped business airplanes.**

Narco proudly reports that every one of these major goals has been achieved beyond the most optimistic expectations. The result? The Narco ADF-29—so totally different in concept, so improved in performance, so simplified for better reliability, so compact that all previous ADF designs and concepts are obsolete

NARCOMATIC SENSOR

Heart of Narco's electronic breakthrough is the patented Narcomatic Sensor, which protrudes only 2½ inches from the aircraft's skin, and complements the clean aerodynamic lines of today's fine business airplanes.

Inside there are no moving parts, just three fixed sensing units which compare signal information 100 times a second. Most important, the Narcomatic Sensor derives its information from the strongest, sharpest, most clearly defined signal of the station tuned—not the null. As a result, the ADF-29 is much less affected by thunderstorms, static or other extraneous signals.

COMPACT, PANEL-MOUNTED, ALL-TRANSISTORIZED

The entire ADF-29 combination receiver and tuning unit mounts simply and easily on the panel in an instrument cut-out measuring 6⅜ by 2⅞ inches. Even the direction needle is incorporated in the face plate, eliminating the need for a separate indicator instrument and finding the space for it in the panel. And the indicator has been designed with an oil-submerged, hermetically-sealed meter movement for faster action, constantly precise bearing indication.

Here are other features you'll like about the Narco ADF-29:

Weighs Only Eight Pounds—about half the weight of other ADF's.

Draws Half an AMP—about one-twelfth the power normally used.

Has Manual Volume Control (plus AVC).

Provides For Correction of quadrantal error.

Price complete $895

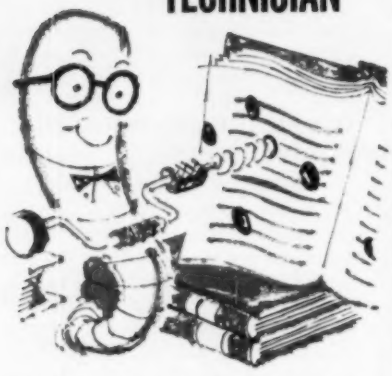
narco ADF-29

See your Narco distributor or write for ADF-29 brochure,
National Aeronautical Corporation, Fort Washington, Pennsylvania

If you're not a bookworm . . .

but love to tinker with tools

STEP OUT AS AN AIRFRAME & POWERPLANT TECHNICIAN



Embry-Riddle's faculty of top-rated instructors can qualify you in shortest possible time. Quickest way to good pay, security and satisfying career. You'll step directly from classroom to substantial paychecks. Thousands of E-R trained men will tell you this.

There's steady demand for *professionally* trained Airframe & Powerplant Technicians licensed by F.A.A. It takes men with specialized knowhow (not just mechanics) to work on engines, wings, fuselages, propellers, control systems, landing gears, carburetors and fuel system riggings.

The combined Embry-Riddle A & P Technician and Commercial Pilot course will give you *dual* pilot-technical ability to "step ahead" even faster.

Mail coupon for brochure of courses tailored to your specific aviation interest. You'll enjoy both study and play in air-minded Miami.

An Accredited Technical Institute

Embry Riddle

AERONAUTICAL INSTITUTE

DIRECTOR OF ADMISSIONS
Embry-Riddle Aeronautical Institute
Aviation Building, Dept. D
Miami 52, Florida

Without obligation, please send me your **Free** 88-page Book and full particulars about the course(s) checked.

Print Name.....

Address..... Age.....

City..... State.....

☐ A & P Technician
☐ A & P combined with Commercial Pilot
☐ Aeronautical Engineering Technology
☐ Flight Courses

MAIL THIS COUPON TODAY

For other courses, see page 77

MAILBOX

(Continued from page 4)

pilots (often with the flight engineer acting as a sort of in-flight mediator) than there ever has been between pilots and flight engineers. This type of cockpit dissension is a matter of personalities. Belonging to the same "club" will not stop it.

Being completely devoted, and rightly so, to piloting, the ALPA cannot properly represent the interests or viewpoints of the flight engineers. This viewpoint of the flight engineer is one of the most important reasons for maintaining a separate union for these people. If there were only one union in the cockpit, it is highly unlikely that the viewpoints of the technical specialists on the aircraft would ever be made known to either the airlines, FAA, CAB, or others. The flight engineer looks at the "total airline operation" somewhat differently than the pilot or mechanic does. He has the benefit of exposure to both maintenance and operations. As such, he can uncover different ideas to improve safety and efficiency. He can make these ideas known to the Federal agencies and carriers for their consideration, *if* he has his own organization. If he is submerged into an organization where there are three times as many people who look at the operation differently than he, his voice will be lost, or at the very least, compromised. The activities of FEIA's Air Safety and Engineering Committee and Accident Investigation Committees take a very large chunk out of our budget each year. This is done for a very special reason. We are, as the pilots, dedicated to the proposition of 100 per cent safety in air carrier operation. While our studies and recommendations on safety matters often vary from those of the ALPA, they carry within them many valuable points which could only be brought out by a technical specialist. A man with a complete knowledge of the airplane and its systems—someone who knows and understands the maintenance procedures and who can fit this knowledge into his daily flight experience. He daily witnesses and experiences the great trust that the industry places upon the reliable performance of the myriad of highly technical and complex systems and powerplants on today's modern airliners. Only he on the flight deck has the interest, the inclination, the background and the training to fully understand the internal workings of this complex machinery and be in a position to make sound technical recommendations which will lead toward that goal of 100 per cent safety. We are convinced that if only one organization represented members on the flight deck this valuable contribution to safety would be lost.

One of the statements made by Captain Kuhn which must be corrected is that "some cockpits have two pilots and an engineer, some three pilots, and some three pilots plus an engineer." There is *no* jet airliner flying today with only "three pilots." The law forbids this. The minimum certificated crew on all of the jet aircraft now in operation is two pilots and one *flight engineer*. Whether the flight engineer had a previous background as a pilot or a mechanic, does not alter the fact that he must receive *special training* and be certificated as a *flight engineer* before becoming a member of a jet crew.

Captain Kuhn's statement that there "will be confusion, discord, hatred and marginal safety at times on the flight deck until the two unions merge" is a vicious statement. It is reminiscent of the many statements that Mr. Sayen, president of ALPA, has said on this subject when trying to tie in his "fail-safe" concept to the proposition that there must be one union in the cockpit.

It is no more an accurate statement than it would be to state that there will be confusion, discord, hatred and marginal safety at all times on the flight deck unless all members belong to the same church or the same political party.

There are many points brought out in Captain Kuhn's article which we agree with wholeheartedly. ALPA's idea of one union in the cockpit *did* start with the problem of technological unemployment when the faster and larger DC-6s and DC-7s replaced the smaller and slower DC-3s and DC-4s. ALPA *did* intensify the one-union concept in 1956 when their jet study report indicated a serious technological unemployment problem as the result of the even larger, and faster jets replacing the piston fleets. The big problem has *always* been a matter of jobs for the ALPA membership. The ALPA solution—steal the flight engineer's job for their own members . . . under the guise of safety if possible . . . by brute force if necessary.

Mr. Kuhn is also right when he says that the jurisdictional dispute has hurt all of the flight crew members in maintaining proper working conditions on the faster jets. We are now flying more days per week and are away from our families more, while at the same time providing the public and the industry with a tremendous increase in available seat miles per crew member. The solution is simple. Let ALPA devote the energies now expended in trying to capture the flight engineer's job to such matters as a reduction in the maximum monthly flight time. This would not only save the third pilot's job, but would, as Mr. Kuhn stated, "let the 'shotgun' fly again, something he would enjoy." If ALPA would take this tactic, FEIA would, of course, not be required to expend resources toward the protection of the engineer's job.

We also know that he is right when he states that "the jet captains will admit secretly that a mechanic-engineer is a most valuable part of the crew."

In closing we would like to make one more statement. We know something of Captain Dave Kuhn's reputation and we strongly suspect that there is no "dissension, hatred or discord" on the flight decks of Captain Kuhn's aircraft. He is a real pilot-in-command and we would be willing to wager that his management of the flight deck sets one of the best examples of how two unions can operate in a cockpit with safety, efficiency, and complete crew coordination.

R. A. Brown, President
Flight Engineers' International Assn.,
Washington, D. C.

Up Where It's SM

TH

with Scott Oxygen Equipment

Choose one of these models and enjoy the Speed, Economy, Comfort and Safety of High Altitude Flying

FIXED MODELS **PORTABLE MODELS**

World's simplest fixed oxygen installation.

Scott Oxygen CONSOLE

Compact. Light Weight. Safe. Lowest priced fixed oxygen system available. Simple to use — just set at cruising altitude and plug in as many masks as needed. Each outlet is an ON-OFF valve. Supplies oxygen for one to five persons.

Oxygen Regulator. Wgt. only 21 oz.

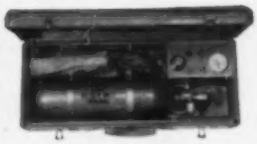
Manifold. Five mask outlets.

Masks included.

Scott "PRESIDENT"

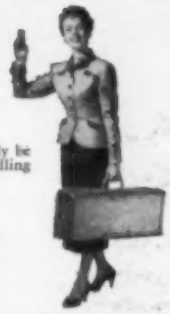
A complete oxygen installation for five people furnished in kit form, for all aircraft. Includes Oxygen Regulator, Manifold, Oxygen Cylinder, Mask Assemblies, all fittings and necessary tubing. A convenient and efficient installation for single and light twin Aircraft.

Scott AVIOX



Cylinder can easily be removed for refilling or replacement.

Complete oxygen breathing equipment for four in a smart, leather luggage case. Portable — F.A.A. weight and balance data is not required. Variable regulator provides maximum oxygen efficiency. Unquestionably the world's finest portable.



Your comfort is "in the bag" when you fly high with a beautiful Aviox.

Scott "EXECUTIVE"

A complete oxygen system — ultra compact . . . self-contained . . . no installation. The Scott EXECUTIVE has all the basic parts to provide supplementary oxygen for one or two persons to 20,000 feet. Carrying handle attached to cylinder by metal straps. Cylinder valve, manifold, oxygen regulator and gauge combined compactly in one unit. Simple to use — just turn knob, plug in masks and breathe! The low price of this complete unit will please you.

SINCE 1932 Scott FOR SAFETY—FOR SERVICE

SCOTT AVIATION CORPORATION

224 ERIE STREET • LANCASTER, NEW YORK

Export: Southern Oxygen Co., 3 West 57th Street, New York 19, N. Y.

West Coast Office: Fulton-Ventura Building, 13273 Ventura Boulevard, Studio City, California

BRIEFINGS...

Airport Surface Detection Equipment (ASDE) is now a permanent part of FAA's air traffic control system at New York's International Airport. Mounted aloft the Idlewild control tower, under an inflated radome, the ASDE antenna rotates at the rate of 60 times per minute, giving the

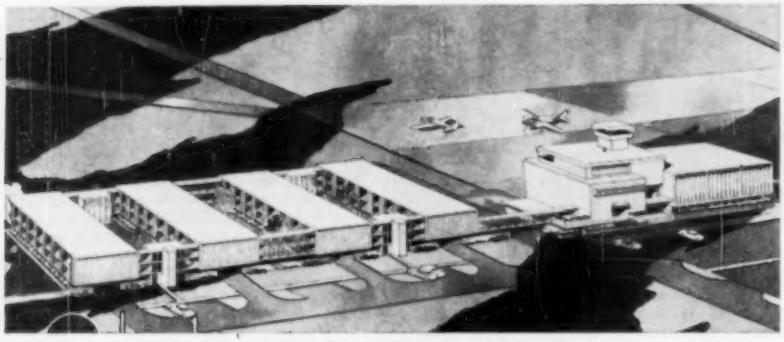
traffic controller a detailed picture of the changing conditions on the surface of the airport 24-hours a day, in all kinds of weather. Produced by Airborne Instrument Laboratories, this is the second of 10 ASDEs to be installed. Newark Airport was the first, Washington (Dulles) the third and latest.

Improved quality of flight instruction and upgrading in status of flight instructors, is the announced broad purpose of the recently organized Flight Instructors Assn. Founder, member and temporary chairman is Princeton University's fencing coach, physical education instructor and flying instructor of Princeton Flying Club. Persons interested in this organization and its program may write Mr. Sieja at 149 Terhune Rd., Princeton, N. J.

Forney Industries, aircraft division, has been purchased by the City of Carlsbad, N. M., it was announced in a joint statement by officials of Forney, the city, and Aircoupe Division of Air Products Co., the parent company which manufactures the two-place all-aluminum Aircoupe. Air Products will operate the plant under lease from the city which provided a $7 million bond issue for the purchase. A. D. Mitchell, Aircoupe marketing director, states production will start immediately, with four times the number of planes scheduled for production over that of the old location at Fort Collins, Colo. To be known as Aircoupe of Carlsbad, the first planes were to be ready by December, 1960.

Applicants seeking airline transport ratings now face a new written examination designed to test a pilot's ability to meet and resolve a series of problems that might confront him on a typical airline flight. However, those applicants who have successfully completed one or more parts of the old sectionalized examination will be permitted to take again the sections which they previously failed, if they apply before July 1, 1961. Test guide for the new examination "ATR Written Examination Guide," prepared by FAA, may be obtained from the Government Printing Office, Washington, D. C., for 10 cents.

Through a nationwide network of approved service facilities, Motorola Aviation Electronics is now offering bench repair at no cost to its customers on Motorola products installed by its authorized agencies, or by original airframe manufacturer, on or after October 1, 1960. Under its new warranty program, Motorola requires only that customer's warranty eligibility be registered at time of installation, and that he present his registration card to the service facility when requesting service.



Executive Airport. First steps in actual construction of a new $8-million executive airport, eight miles south of Ft. Worth, Tex., were taken recently with the signing of a $2-million contract for hangar construction. Developers and operators are Sphere, Inc., comprising a group of local business executives headed by Raymond H. Beyer, president. Located on a 650-acre tract, known in WW I as Barron Field, a "Jenny" training base, the new base will include motor hotel, restaurant, four-story-terminal-office building (architect's sketch, above) an all-weather airport with a 6,000-foot and two 3,000-foot runways, and hangar space for 240 aircraft. It is scheduled to be operational October, 1961, fully completed by March, 1962.

Canada's outstanding aviation award, the McKee Trophy, is presented to the Hon. J. A. D. McCurdy (right) by Canada's new Minister of Transport, the Hon. Leon Balcer, in Quebec City at annual meeting of

the Air Industries & Transport Assn. Mr. McCurdy, in addition to being the first person to fly an aircraft in the British Commonwealth, has for many years been closely affiliated with aviation affairs in Canada.

Gyrotor, a newly established helicopter firm, headed by Ilow C. Limb, former Rohr Aircraft Corp. engineer, has opened offices in San Diego, Calif. in the Institute of Aeronautical Sciences Building. Dr. Andreas B. Rechnitzer, Navy research scientist, is Gyrotor board chairman. The firm holds patents on a helicopter rotor system which incorporates six major new ideas, claimed by company officials to greatly reduce manufacturing cost of helicopters, eliminate problems of vibration and extend life span of the machines. The company is negotiating for a manufacturing site in the area.

Citizens of Holdrege, Neb.—5,000 strong—and top officials of the state, turned out to honor the community's 88-year-old Dr. Frank Brewster, the "world's first flying surgeon" and dedicate their new airport in his name. Formal dedication took place with the unveiling of a bronze plaque with

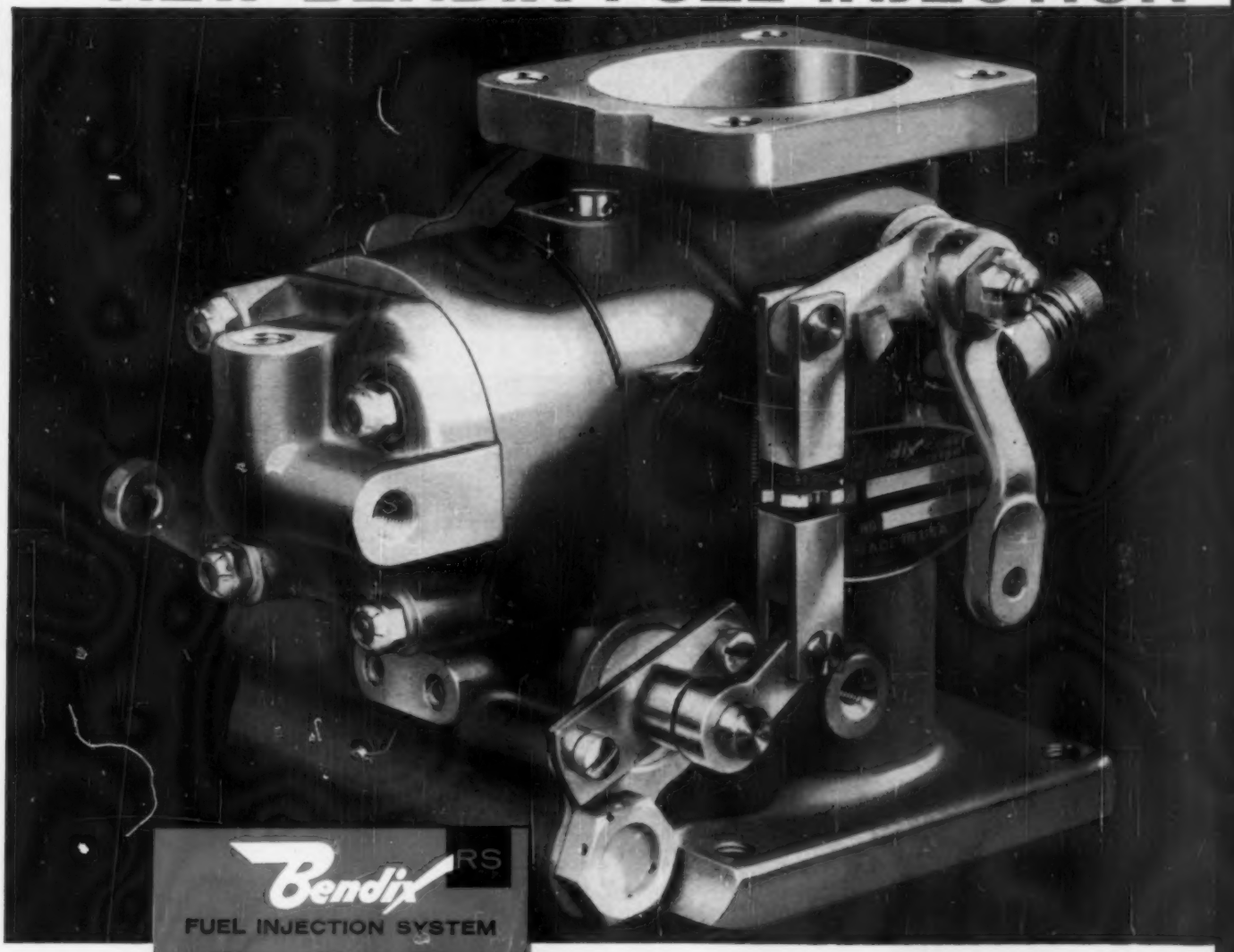
a bas-relief of Dr. Brewster, the name "Brewster Field" and legend "World's First Flying Surgeon." Dr. Brewster's first airplane was a Jenny costing $8,000. In 41 years of flying he has had no accidents. Two sons, F. Wayne and Don, are both doctors and flyers.

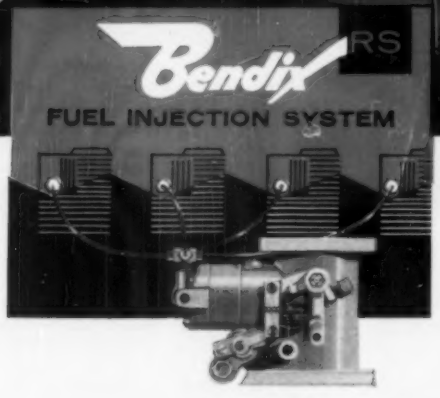
Honors for "safest" Reserve flyers unit in the U. S. Air Force have fallen to the 514th Troop Carrier Wing of Mitchel AFB, N. Y. During the period for which the award was made—the first six months in

(Continued on page 106)

Greater fuel economy for light aircraft engines

NEW BENDIX FUEL INJECTION





CHECK THESE FEATURES

- Unitized package—no engine speed drive pad.
- Fewer moving parts, lower overhaul costs.
- Uniform fuel distribution to all cylinders.
- Longer engine life—no hot cylinder heads.
- No throttle body ice, no vapor locks.
- Leaner engine operation, greater fuel economy.

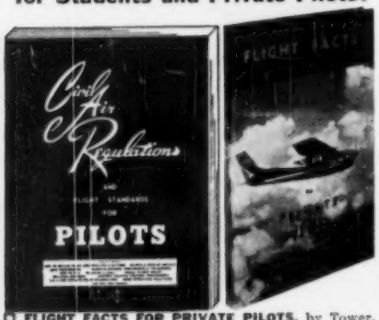
The new Bendix® RS Fuel Injection System for light aircraft engines offers an unequalled combination of advantages. The system measures mass-air-flow rather than engine speed . . . and engine speeds can be adjusted at any time without affecting the rest of the power curve. It automatically maintains constant fuel/air ratios and load compensation over the complete power range under all operating conditions. And the Bendix RS Fuel Injection System offers design flexibility to give optimum power/economy performance.

Bendix PRODUCTS DIVISION South Bend, IND.

THE Bendix CORPORATION

A "COMPLETE" LIBRARY

In Only 2 Volumes for Students and Private Pilots!



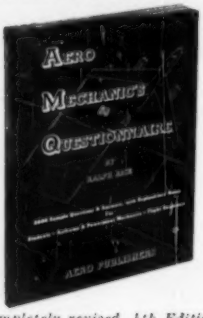
☐ **FLIGHT FACTS FOR PRIVATE PILOTS,** by Tower. 250 illustrations and 200 pages of easy-to-understand text covers all basic subjects. Theory, control, weather, engines, structures, navigation, and **instrument flight.** Acclaimed to be the best of its type ever published! Full-color covers. Hardbound: $5.00. Paperbound: $3.50.

☐ **CIVIL AIR REGULATIONS AND FLIGHT STANDARDS FOR PILOTS,** by Aero Publ Staff. 22nd Edition of all applicable F.A.A. regs, standard procedures, typical written exam for private pilots, illustrated aerial maneuvers (in color) license requirements, etc. Hardbound: $4.00. Paperbound: $2.50.

SPITFIRE!

☐ **SPITFIRE, THE STORY OF A FAMOUS FIGHTER,** by Bruce Robertson. Includes 275 excellent photos, 56 fuselage profiles showing camouflage and serials. 30 full-page two-tone drawings. Large 8½ x 11 size volume, with full-color jacket. $8.50.

NEW MECHANIC'S AID!



Completely revised 4th Edition

☐ **AERO MECHANIC'S QUESTIONNAIRE,** by Ralph Rice. 2,225 questions on all subjects of airframe and powerplant! Correct answers are given, along with **full explanation** of why this answer is correct. All types aircraft, including jets and helicopters. Excellent reference manual, or to prepare for exams. Hardbound: $6.50. Paperbound: $5.00.

— CLIP AND MAIL FOR PROMPT DELIVERY —

"My money-order or check is enclosed for the following: .....

.....

I understand unsatisfactory items can be returned for full refund."

Name .....

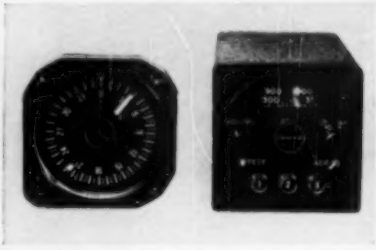
Address .....

AERO PUBLISHERS, INC.

Dept. F-1, 2162 Sawtelle Blvd., Los Angeles 25, California

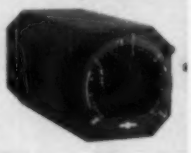
NEW PRODUCTS

Lightweight ADF system with two-band tuning over the 190-1750-kc range, the latest item in airborne equipment with Tamar Electronics, Inc., Gardena, Calif., is known as the Pres-To-Nav Model TN-1. Innovations include three rapid pre-set pushbuttons which permit automatic tuning of preselected frequencies such as marker beacons and locators for ILS approach. A separate three-inch indicator (left) incorporates a rotatable azimuth. The transistor-powered amplifier unit is housed in a ¾ ATR package.



Self-contained two-way radio for business communications, operating within the 150-174-mc range, is new with Gonset Division, Young Spring & Wire Corp of Burbank, Calif. Called the G-150 "Business Communicator," it is designed for both stationary and mobile installation. Power input is stated at over two times the maximum five-watt input permitted by FCC for the 27-mc Citizens Band service. The G-150, FCC type accepted, is available for 6-, 12-, or 24-volt DC (mobile service) or 117-volt AC for fixed station service.

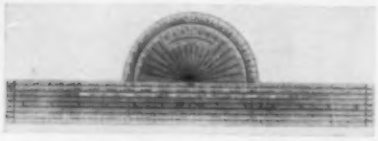
Now available from Collins Radio Co. for use with their WP-103 Airborne Weather Radar System, is an optional bright tube indicator, the 493A-3. Installed directly in the instrument panel, this 13-pound indicator permits daylight viewing without use of a scope hood and allows both pilots to view the presentation simultaneously. An adjustable polaroid filter permits dimming during night operation. The presentation can be varied by the pilot from its normal yellow-green color to red for individual preference. Radar range selection is by a control mounted either on the indicator or on radar system control panel.



For ease in cold weather starting, Haynes Equipment Co., 62 Voorhis Lane, Hackensack, N. J. has developed the "Aerostart," an auxiliary power connector which operates from any 12-volt automobile battery. The assembly includes a 12-foot rubber-covered electrical power cable and connectors. Metal parts are protected by rubber casings; are shock-proof and moisture-proof. Spring-type battery clips have black and red rubber caps for identification of negative and positive leads. The bronze female connector, permanently installed in the aircraft, makes opening the engine compartment unnecessary. Aerostart sells for $69.

Collins Radio is marketing a new omni converter, the 344D-2, which adds glide slope information to VOR/LOC readings. Similar to Collins' 344D-1, but with additional cross-pointer service, the new unit can be used with standard VOR and glide slope receivers; is self-contained with power input supplied from primary aircraft power source, and weighs 2.4 pounds. Price, $1185.

Weems System of Navigation has added the Weems Aircraft Plotter MK II-W, to its aircraft plotter series. The Mark II-W, same size and shape as the Mark II, features a white back-up of all course and mileage scales and is completely reversible with scales identical on both sides. The platter itself is transparent; only the printed scales and numerals have white backing. The price is $2.00.



Correction. Price for B. F. Goodrich De-Icers, mentioned at "$995, including kit" in November FLYING (page 11) should read $1,275 to $1,560 depending on make and model of airplane. Installation charges are extra. The $995 figure, inadvertently transposed from the item below, same column, is actually the price of Motorola's new ADF-T-12.

WHO and WHERE

Harlan Ray has moved up to board chairman of Southwest Airmotive with Winston Castleberry elected to president of the firm's service division, and George W. Jalonick III to president of its distribution division; all at headquarters, Love Field, Dallas.

C. H. Pulley has succeeded Leslie L. Irwin to presidency of Irving Air Chute Co., Inc., Lexington, Ky. Irwin has become chairman of the board. E. W. Smith, former technical director, is now executive director of research and development at Glendale, Calif.

C. J. Weltsch is named vice president-finance and board member of King Radio Corp., Merriam, Kan.; James R. Harris, comptroller and director in charge of manufacturing and Bernard L. Glover Jr., southeastern states regional sales manager.

V. E. Larimer has joined Golden Gate Aviation Inc., Burbank, Calif., Beechcraft distributors, as president and director. Larimer was previously with Beech Aircraft in Wichita, and most recently vice president of Atlantic Aviation and general manager of its New York division.

Friedrich L. von Doblhoff has been named European engineering director for the Boeing Airplane Co. Former director of engineering, international, for the Boeing Vertol Division, von Doblhoff is known for his development during WW II of the principle of the rotor-tip-jet helicopter now used in the Fairey Rotodyne and other helicopters. His headquarters remain in Bad Godesberg, Germany.

(Continued on page 15)

5-Passenger 1961 Navion Rangemaster

Navion Rangemaster–Beauty, Luxury, Utility

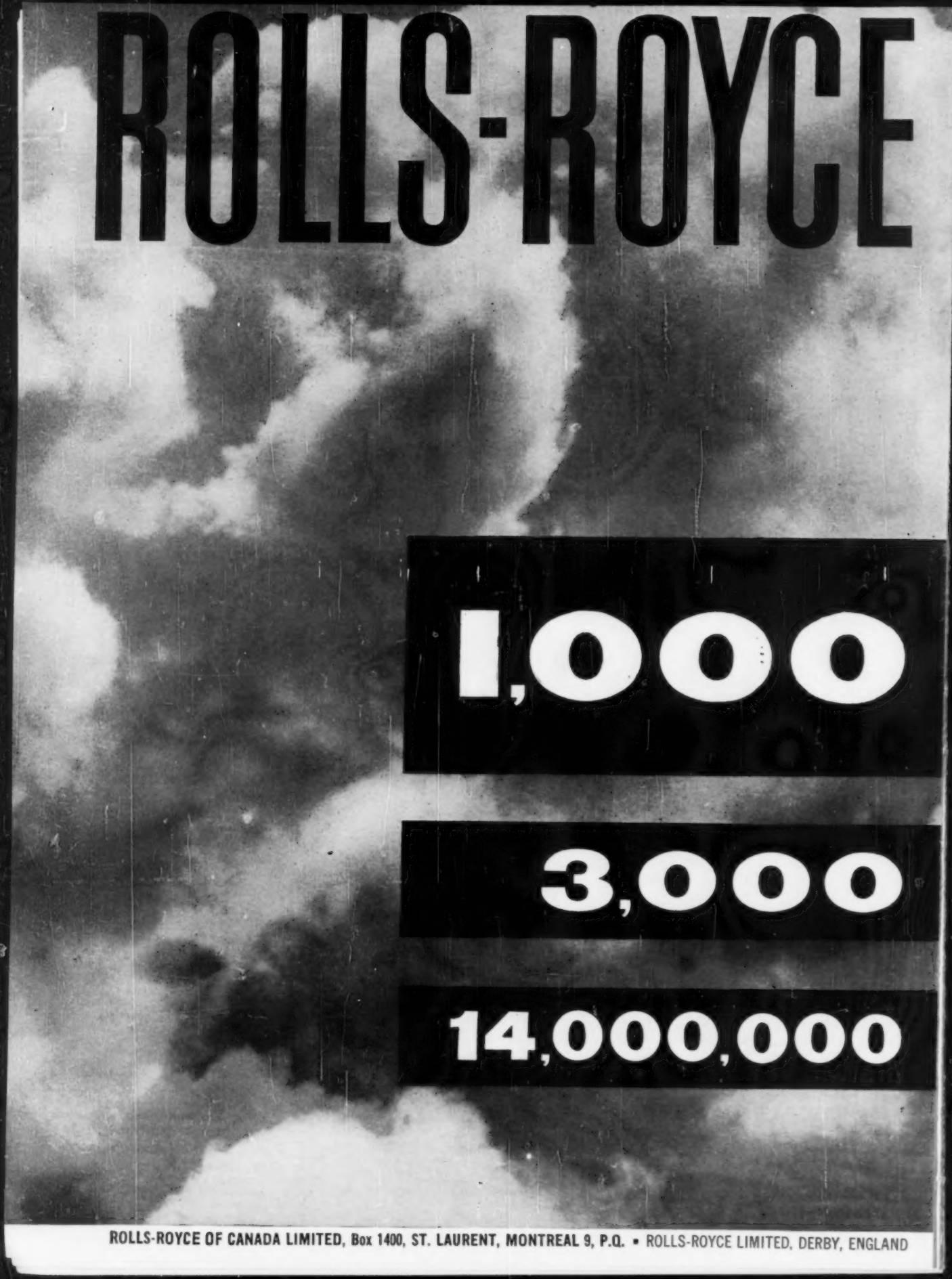
Here is an honest-to-goodness airplane experienced professional pilots love to fly—a plane that offers all the stable, forgiving characteristics that even inexperienced pilots prefer.

The 1961 Navion Rangemaster is fast—normal cruise over 180 mph; with the longest range in its class—up to 1500 miles; it has more seating capacity—five passengers ride in complete comfort. The New Navion Rangemaster has more equipment and more luxury as standard than any other craft in the field. Make the comparison, send for your free copy of the folder: Navion Rangemaster's Outstanding Features.

Navion AIRCRAFT COMPANY

P. O. Box 3126, GALVESTON, TEXAS

Division of Tusco Corporation



ROLLS-ROYCE OF CANADA LIMITED, Box 1400, ST. LAURENT, MONTREAL 9, P.Q. • ROLLS-ROYCE LIMITED, DERBY, ENGLAND

GAS TURBINES

civil aircraft

Over one thousand Civil Aircraft powered by Rolls-Royce gas turbines have been ordered by commercial operators.

hours overhaul life

The 3,000 hour overhaul life of the Rolls-Royce Dart prop-jet is the highest ever approved for any aero engine.

hours experience

Rolls-Royce gas turbines have flown over 14 million hours in commercial service. This total is increasing at the rate of 5 million hours per year.

ROLLS RR ROYCE

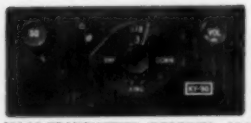
AERO ENGINES • MOTOR CARS • DIESEL AND GASOLINE ENGINES • ROCKET MOTORS • NUCLEAR PROPULSION

KING MAN ON THE *Spot!*

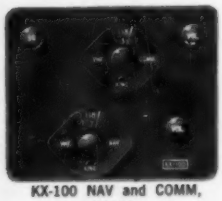
Each King Man is put on the spot by King Radio Corporation—to assure you that he and his shop merit a King dealership.

King Certified Dealers are carefully selected. Each has a completely equipped radio shop with personnel highly qualified to install and maintain aircraft-quality electronic equipment. Each can make realistic, economical recommendations on the radio equipment you need. And King dealers *are* always on the spot—near you—ready and qualified to serve you with "Tomorrow's Aircraft Equipment—TODAY!"

KING.. Tomorrow's Radio Equipment..TODAY!



KY-90 TRANSMITTER/RECEIVER, $845



KX-100 NAV and COMM, $1195

KR-40 NAV RECEIVER, $485

KI-200 CONVERTER/INDICATOR, $645

and KING'S newest— KA-10 ISOLATION AMPLIFIER, $79.50

©1961, KING RADIO CORP.

KING RADIO CORP.

Olathe, Kansas

Builders of TOMORROW'S Aircraft Equipment TODAY!

HERE IS YOUR KING MAN ON THE *Spot!*

KING RADIO CORP. sells through these franchised dealers in the U. S. and Canada

ALABAMA
Montgomery—Montgomery Aviation Corp.

ARIZONA
Phoenix—Hawkes Aviation, Inc.

ARKANSAS
Little Rock—Central Flying Service, Inc.
Kenneth Starnes Aviation Service, Inc.
Stuttgart—Flying Farmers, Inc. of Grand Prairie

CALIFORNIA
Bakersfield—Pemberton Flying Service
Burbank—Qualitron, Inc.
Fresno—The Air Oasis Co.
Hawthorne—Bates Aviation, Inc.
Inyokern—Desert Aero
Long Beach—Aircraft Electronics
Oakland—Bayaire Avionics, Inc.
Oxnard—Airtronics
Riverside—Land-Sea-Air
Sacramento—Patterson Aircraft Co.
San Carlos—Pacific Avionics, Inc.
San Francisco—Bay Aviation Service Co.
San Jose—San Jose Avionics
Wright Brothers, Inc.
Santee—Bell Airborne Electronics
Van Nuys—Pacific Air Radio, Inc.

COLORADO
Denver—Aircraft Radio & Accessory Co., Inc.
Mountain States Aviation, Inc.
Greeley—Nolan Aviation Sales

CONNECTICUT
Chester—Aerotronics Engineering, Inc.
New Haven—Barbour-Daniel Electronics, Inc.
Windsor Locks—Kemp Communications, Inc.

FLORIDA
Ft. Lauderdale—Sunny South Aircraft Service
Jacksonville—L. D. Bragg Aviation Electronics
Miami—Florida Aircraft Radio & Marine
Peninsular Aircraft Radio, Inc.
Sarasota—Sandy's Radio Co.

GEORGIA
Atlanta—Southern Aero Radio
Southern Airways Co.
Chamblee—DeKalb Aviation Corp.

ILLINOIS
Chicago—Butler Aviation, Inc.
East Alton—Walston Aviation Corp.
Northbrook—Mid-State Aviation Corp.
Polo—Radio Ranch
Quincy—Business Aircraft, Inc.
Springfield—Capitol Aviation
Wheeling—George J. Priester Aviation

INDIANA
Indianapolis—Sky Harbor Airport, Inc.
Valparaiso—Valparaiso Aero Service, Inc.

IOWA
Cedar Rapids—Wathan Flying Service
Des Moines—Des Moines Flying Service
Waterloo—Ben's Aircraft Service

KANSAS
Topeka—Topeka Aircraft Sales
Wichita—United Airplane Sales, Inc.
Yingling Aircraft Co.

KENTUCKY
Louisville—Aircraft Radio Laboratory

LOUISIANA
New Orleans—Deltair Aircraft Co.

MARYLAND
Baltimore—Air Mod
Hinson Aviation

MASSACHUSETTS
East Boston—Aero-Marine Radio Co.
Atlantic Aviation Corp.
Norwood—E. W. Wiggins Airways, Inc.

MICHIGAN
Detroit—Anderson Aircraft Radio Co.
Pontiac—Aerodynamics, Inc.
Three Rivers—Ward Aero Service

MINNESOTA
Minneapolis—Minnesota Airmotive
Rochester—Gopher Aviation
South St. Paul—Gopher Aviation
Winona—Van's Air Service, Inc.

MISSOURI
Cape Girardeau—Avicom, Inc.
Kansas City—Executive Aircraft Co.
St. Louis—Young Aviation
Springfield—Rapidair, Inc.

NEBRASKA
Omaha—Sky Harbor Air Service

NEVADA
Las Vegas—Alamo Airways

NEW JERSEY
Teterboro—Atlantic Aviation Corp.

NEW MEXICO
Albuquerque—Cutter-Carr Flying Service, Inc.
Santa Fe—Southwestern Skyways, Inc.

NEW YORK
Buffalo—Buffalo Aeronautical Corp.
Lindenhurst, L. I.—Dat Airtronics
Rochester—Page Airways, Inc.
White Plains—International Aviation, Inc.
Westfield Aircraft Elect., Inc.

NORTH CAROLINA
Charlotte—Cannon Aircraft Executive Terminal, Inc.
Greensboro—Highpoint Air Service, Inc.

OHIO
Cincinnati—Airborne Communications, Inc.
Valair Radio
Cleveland—Conrad Radio Corp.
Columbus—Aircraft Distributing Co.
Youngstown—Youngstown Airways, Inc.

OKLAHOMA
Bethany—Sky Service Co.
Oklahoma City—Aircraftsmen, Inc.
Catlin Aviation Co.
Tulsa—Aerotron Radio Co.
Aircraft Management Co.
Tulsaire Distributors, Inc.
Ross Aviation, Inc.

OREGON
Portland—Flightcraft, Inc.
Troutdale—Skyways, Inc.

PENNSYLVANIA
Butler—T. A. Gall Aircraft Radio Service
Dravosburg—Beckett Aviation
New Cumberland—L. B. Smith Aircraft Corp. of Pa.
Philadelphia—Atlantic Aviation Services, Inc.
Wings, Inc.
Reading—Reading Aviation, Inc.

RHODE ISLAND
Warwick—Eastair Corporation

SOUTH CAROLINA
Charleston—Hawthorne Aviation

SOUTH DAKOTA
Yankton—Airborne Electronic Division of
Yankton Electronic Service

TENNESSEE
Memphis—Dixie Air Associates, Inc.
Nashville—Nashville Flying Service, Inc.

TEXAS
Addison—Brown Aero Corporation
Dal-Tex Aviation, Inc.
Austin—Capitol Aviation, Inc.
Beaumont—Southern Avionics Co.
Corpus Christi—Gulf Coast Aviation
Dallas—Gray Aircraft Service Co., Inc.
Airborne Electronics, Inc.
Galveston—Rhodes Aircraft Sales and Service
Houston—Continental Radio Co., Inc.
Cruse Aviation, Inc.
Cummings and Groves Aviation, Inc
Lubbock—Champ's Aviation, Inc.
Plainview—Claude Hutcherson Air Service
San Antonio—Matthews Electronics

UTAH
Ogden—Southwestern Skyways, Inc. of Utah
Salt Lake City—Salt Lake Aircraft Parts

WASHINGTON
Renton—Renton Aviation

WISCONSIN
Madison—Van's Air Service
Milwaukee—Aviation Radio Co.
Butler Aviation

CANADA
Goderich, Ontario—Pattison Radio Sales & Service
Malton, Ontario—Sanderson Acfield Aircraft, Ltd.
Georgetown, Ontario—Upsilon Communications
Montreal, Quebec—Laurentide Aviation, Ltd.

© 1961, KING RADIO CORP.
Export by REA International, 86 Broad St., N.Y.

KING RADIO CORP.
Olathe, Kansas

Who and Where

(Continued from page 10)

Mark DeGroff, Tulsa, Okla., is appointed aviation and business administrator of the Flying Physicians Assn. Dr. H. D. Vickers, Little Falls, N. Y. to office of medical director, and editor of FPA publications.

George W. Haldeman has been appointed Special Assistant to the Civil Aeronautics Board Safety Bureau director, Melvin C. Gough. Haldeman, a 20-year man with FAA's predecessor CAA, is one of the nation's first transatlantic pilots (1927). During his CAA tenure he had served in many piloting and engineering positions and in 1955 graduated from the USAF jet qualification course.

Dr. Mattison L. Story, former dean of Tusculum College, Greeneville, Tenn. has assumed the duties of director of editorial and curriculum in the office of Aerospace Education at National Headquarters, Civil Air Patrol. Ellington AFB, Tex.

Ralph Helmericks has joined Bell Helicopter as manager for plans and training; John Edwin Schwartz, as export regional sales manager in its commercial sales department, Fort Worth. Their posts are new at Bell.

Jerry Mann, former general manager of baseball star Mickey Mantle's southwestern enterprises, has been appointed president of Business Wings, Inc., Cessna distributors located at Southwest Airmotive Corp.'s facilities, Love Field, Dallas.

T. K. Vickers, Indianapolis, is elected midwest councilor of the Air Traffic Control Assn. (ATCA). He was formerly chief air traffic control specialist at FAA's NAFEC, Atlantic City, N. J.

Donald G. Schuler, Kirby L. Brannon, Charles J. Winger and Robert T. Williams, respectively, have been appointed assistant regional managers for FAA's Region 2 (Fort Worth), Region 3 (Kansas City), Region 4 (Los Angeles) and Region 5 (Anchorage, Alaska). Schuler is a transferee from FAA's Experimental Center, Atlantic City, N. J., Brannon from the Bureau of Flight Standards, Washington, D. C.; Winger from Airports Division in Los Angeles. Williams was Acting Assistant Regional manager at Anchorage.

William Kolb, former chief pilot for Electra Manufacturing Co., Kansas City, Mo. has joined sales staff of the Aviation Service Division, Spartan Aircraft, Tulsa, Okla.

M. A. Alson has been named vice president-sales, and Francis Schmidt engineering vice president of Brantly Helicopters.

Robert L. Hall, vice president, Grumman Aircraft and Engineering Co., and Vance Breeze, both veteran test pilots, for their devotion to the advancement of manned flight, have been awarded honorary fellowships in the Society of Experimental Test Pilots.

Jimmie Mattern, original around-the-world solo flyer in 1933, is the new president of the OX-5 Club of America. He is a founder member and former president of the California chapter of the club.

New for 1961:

CESSNA

announces a great new line
of twelve business aircraft
in five new divisions:

LOW-PRICE 5
PREMIUM 3
UTILIPLANES
THE EXECUTIVE TWIN
ROTARY WING AIRCRAFT

What's your need... Name your Cessna

WHAT'S YOUR NEED / NAME YOUR
CESSNA
N1296

310

The 310 F... the world's best all around, light, twin-engine, executive aircraft offers twin 260-hp Continental engines... continuous flow fuel injection... speeds up to 242 mph... all way 'round third window visibility... electrically operated retractable landing gear... five versatile seating arrangements... new needle nose and fuel tip tank styling... optional auto-pilot... electrically operated split-type, dual-purpose flaps... new "eyes-on-the-road" instrument panel... spacious baggage compartments... extra wide cabin door... all this, and the "two of everything that counts" concept, provides true twin-engine safety for the 310 F... also provides you with truly twice the buy! How much? It's double your dream of a light twin. That's your answer!

SEATING CAPACITY	Five
MAXIMUM SPEED	242 mph
CRUISE SPEED	220 mph
MAXIMUM RANGE (130 gals.)	1,340 miles
RATE OF CLIMB: Twin Engine	1,800 fpm
Single Engine	440 fpm
TAKE-OFF RUN	800 ft.
LANDING ROLL	620 ft.
SERVICE CEILING: Twin Engine	21,300 ft.
Single Engine	7,700 ft.
BAGGAGE CAPACITY	200 lbs.
GROSS WEIGHT	4,830 lbs.
ENGINE	Two 260-hp Continental Fuel-Injection

All Performance Figures Are Based on Gross Weight

210

310F

SKYLARK

SKYLANE

SKYHAWK

185

150

SKYHOOK

185

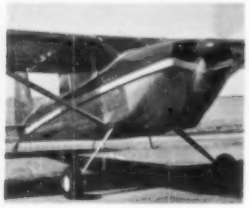
The all-new 185-Skywagon carries six, full-size adults and 270 pounds of extra weight allowance with full fuel at speeds up to 176 mph — or when equipped with floats, will carry five full-size adults with extra weight allowance to spare and full fuel at speeds up to 150 mph ... presenting a profit-boosting package of extra payload, extra power! An outstanding array of features and options mark it instantly as the most productive and versatile airplane of its class! Easily converted to heavy cargo duty. Quickly adaptable for agricultural spray operation. Interchangeable float, ski, or wheel landing gear ... 260-hp, fuel injection for nimble performance at full load. "Eyes-on-the-road" instrument panel ... third window visibility ... optional long-range fuel tanks ... and all the other Cessna-proven basic advantages make the 185 Skywagon today's **best** answer for carrying profit-packed payloads.

SEATING CAPACITY	Standard 1 – 2, 4, or 6 Optional
MAXIMUM SPEED	176 mph
CRUISE SPEED	165 mph
MAXIMUM RANGE (with Standard Fuel Tanks)	885 miles
MAXIMUM RANGE (with Optional Fuel Tanks)	1,160 miles
RATE OF CLIMB	1,000 fpm
TAKE-OFF RUN	740 ft.
LANDING ROLL	425 ft.
SERVICE CEILING	17,300 ft.
BAGGAGE CAPACITY	120 lbs.
GROSS WEIGHT	3,200 lbs.
ENGINE	260-hp Continental Fuel Injection

All Performance Figures Are Based on Gross Weight

180

You can speed through the skies and descend directly where the problem is ... on water, snow, ice, or land ... in a payload proven Cessna 180 for '61. Easy controllability and stable flight characteristics make operations essentially the same on floats, skis, or the rugged, always dependable spring-steel landing gear! Balanced versatility, plus high-stability wing ... power-to-spare, 230-hp, smooth, six-cylinder Continental engine ... Para-Lift flaps ... all-metal construction ... Polycloud seating comfort ... instantly responsive toe brakes ... two yard-wide doors ... optional automatic flight system ... "eyes-on-the-road" instrument panel ... and dozens of other features give the 180 greater dimensions of profit-loaded travel operations.



SEATING CAPACITY	Four
MAXIMUM SPEED	170 mph
CRUISE SPEED	160 mph
MAXIMUM RANGE	845 miles
RATE OF CLIMB	1,130 fpm
TAKE-OFF RUN	555 ft.
LANDING ROLL	350 ft.
SERVICE CEILING	21,500 ft.
BAGGAGE CAPACITY	120 lbs.
GROSS WEIGHT	2,650 lbs.
ENGINE	230-hp Continental

All Performance Figures Are Based on Gross Weight

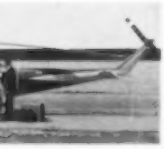
150

You'll find an amazing array of big-plane features on the 150 for '61 . . . high-stability wing, Land-O-Matic gear repositioned for improved ground handling . . . Para-Lift flaps . . . all-metal construction . . . all-new "eyes-on-the-road" instrument panel . . . new rear cabin windows (for an extra 15% in added visibility) . . . tubeless tires . . . steerable nose wheel . . . positive-action brakes . . . full 80-pound luggage space . . . smooth, powerful, 100-hp Continental engine . . . large cabin doors with flush inside door handles and semi-flush window latches . . . spacious interiors with optional individually adjustable seating . . . and there's much, much more! All adding up to solid reasons why the 150 is the biggest value in two-place airplane history!

SEATING CAPACITY	Two
MAXIMUM SPEED	124 mph
CRUISE SPEED	121 mph
MAXIMUM RANGE	630 miles
RATE OF CLIMB	740 fpm
TAKE-OFF RUN	680 ft.
LANDING ROLL	360 ft.
SERVICE CEILING	15,300 ft.
BAGGAGE CAPACITY	80 lbs.
GROSS WEIGHT	1,500 lbs.
ENGINE	100-hp Continental

All Performance Figures Are Based on Gross Weight

SKYHOOK



The Skyhook for '61 . . . Cessna's advanced designed, rotary-wing aircraft . . . . incorporates new, outstanding, years-ahead engineering achievements of mechanical simplicity for maintenance, performance, and operating ease previously unavailable in rotary-wing aircraft! The Skyhook offers many new "Firsts" in aviation history . . . THE WORLD'S FIRST POWER PLANT DESIGNED SPECIFICALLY FOR A ROTARY-WING AIRCRAFT — a supercharged, reciprocating Continental engine . . . THE WORLD'S FIRST WORLD-WIDE SERVICE AND PARTS ORGANIZATION — already established and available to every Skyhook owner . . . THE WORLD'S FIRST ROTARY-WING AIRCRAFT WITH SIMPLICITY OF DESIGN — there's less moving parts to assure longer service life, minimum maintenance expense . . . THE WORLD'S FIRST HOLDER OF AN INSTRUMENT FLIGHT RATING CERTIFICATE FOR A ROTARY-WING AIRCRAFT — made possible by stability (comparable to a fixed-wing airplane) that greatly simplifies control characteristics. All this PLUS the largest, most deluxe cabin area ever developed for a four-place, rotary-wing aircraft . . . An exclusive, patented airspeed indicator that automatically indicates maximum speed for existing operating conditions and eliminates mental error . . . Cruising Speeds up to 122 mph . . . Climb rate of 1,030 fpm . . . Maximum Cruising Range of 5.4 hours with auxiliary tanks (90 gallons total, 60 gallons standard) . . . and BEST OF ALL, the Skyhook is ready now to create new utility and transportation concepts in travel flexibility for your company! Arrange for a FIRST look! See your Cessna Dealer NOW!

210

How much can you expect and get in a 210 for '61? There's more head room . . . more visibility (with a third window added port and starboard) . . . more grace, elegance, and sophisticated style. And most important, there's proof of performance! Thousands have applauded its distinctive features introduced in 1960 — all the advantages of high-stability wing — plus, positive action, performance proven, fully retractable gear . . . simplified fuel injection . . . a big, dependable, 260-hp engine . . . hydraulically operated Para-Lift flaps . . . "flight command" instrument panel . . . speeds up to 199 miles per hour . . . posture-padded, adjustable seating . . . outside access to baggage compartment . . . and a host of other pertinent points of power, performance, and prestige. All tested . . . all meeting the test!

SEATING CAPACITY	Four
MAXIMUM SPEED	199 mph
CRUISE SPEED	190 mph
MAXIMUM RANGE	1,075 miles
RATE OF CLIMB	1,300 fpm
TAKE-OFF RUN	740 ft.
LANDING ROLL	520 ft.
SERVICE CEILING	20,700 ft.
BAGGAGE CAPACITY	120 lbs.
GROSS WEIGHT	2,900 lbs.
ENGINE	260-hp, Continental Fuel-Injection

All Performance Figures Are Based on Gross Weight

182

How much can you expect and get from the 182 for '61? Here's a quick example: Flight/Sweep STYLING . . . a full four inches lower for superb ground handling and easier entry-exit . . . POWER — and plenty of it, offered by the great, time-tested, service-proven, Continental 230-hp engine . . . SPACE — generous cabin dimensions provide expansive stretch-out, move-around freedom, plus space for long-trip luggage requirements . . . PERFORMANCE — you can cruise at 157 mph or at top speeds of 167 mph, and you have a maximum range of 835 miles non stop! All this plus the exclusive Cessna "stand-by standards" . . . Land-O-Matic gear, Para-Lift flaps, all-metal construction, high-stability wing, and dozens of other performance, power, and prestige features!

SEATING CAPACITY	Four
MAXIMUM SPEED	167 mph
CRUISE SPEED	157 mph
MAXIMUM RANGE	835 miles
RATE OF CLIMB	1,030 fpm
TAKE-OFF RUN	555 ft.
LANDING ROLL	560 ft.
SERVICE CEILING	19,800 ft.
BAGGAGE CAPACITY	120 lbs.
GROSS WEIGHT	2,650 lbs.
ENGINE	230-hp Continental

All Performance Figures Are Based on Gross Weight

SKYLANE

When you buy and fly the Skylane . . . you'll receive all the features in the 182 . . . plus additional speed, range, styling, and a host of equipment extras! More than a dozen equipment items normally considered optional are standard on the distinctively styled, deluxe-equipped, and fully painted Skylane . . . including gyros with engine-driven vacuum system . . . Narco Omnigator, Mark II . . . tinted windows and windshields . . . speed fairings . . . plus many others. And the Skylane . . . the "upper classmate" of the Mighty Middle line . . . is the outstanding dollar value in the medium-priced field.

SEATING CAPACITY	Four
MAXIMUM SPEED	170 mph
CRUISE SPEED	160 mph
MAXIMUM RANGE	845 miles
RATE OF CLIMB	1,030 fpm
TAKE-OFF RUN	555 ft.
LANDING ROLL	560 ft.
SERVICE CEILING	19,800 ft.
BAGGAGE CAPACITY	120 lbs.
GROSS WEIGHT	2,650 lbs.
ENGINE	230-hp Continental

All Performance Figures Are Based on Gross Weight

175

How much stepped-up power, performance, prestige, and dollar-for-dollar value can you expect and get in a 175 for '61? Look it over and you'll get a quick and positive answer. Look at the flight/sweep styling. Study the new "Blend Temp" heating and ventilation system for maximum year 'round comfort. Inspect the new magnetic fuel gauges. Add to these features "floating cowl suspension" and the exclusive Cessna "stand-by standards" . . . Land-O-Matic gear . . . Para-Lift flaps . . . all-metal construction . . . sky-high fashion interior styling . . . and you have the top-value in a low-cost, step-up opportunity for 1961 . . . The Cessna 175 for '61!

SEATING CAPACITY	Four
MAXIMUM SPEED	147 mph
CRUISE SPEED	140 mph
MAXIMUM RANGE	755 miles
RATE OF CLIMB	850 fpm
TAKE-OFF RUN	735 ft.
LANDING ROLL	590 ft.
SERVICE CEILING	15,900 ft.
BAGGAGE CAPACITY	120 lbs.
GROSS WEIGHT	2,350 lbs.
ENGINE	175-hp, "Power-Geared" Continental

All Performance Figures Are Based on Gross Weight

SKYLARK

Brightly, sprightly designed, inside and out, the new, deluxe-equipped, fully painted and distinctively styled Skylark has all the great go-ahead features of the 175, plus many other outstanding extras — extras, such as a complete set of gyro and primary flight equipment, an engine-driven vacuum pump, a new push-button starter, speed fairings, navigation light flasher, sun visors . . . and more! Extras normally listed as optional on other aircraft . . . but standard on the Skylark . . . the "upper classmate" of the top-value, low-cost, step-up class! You'll be agreeably pleased with its economy of operation and maintenance . . . its high re-sale value!

SEATING CAPACITY	Four
MAXIMUM SPEED	149 mph
CRUISE SPEED	142 mph
MAXIMUM RANGE	760 miles
RATE OF CLIMB	850 fpm
TAKE-OFF RUN	735 ft.
LANDING ROLL	590 ft.
SERVICE CEILING	15,900 ft.
BAGGAGE CAPACITY	120 lbs.
GROSS WEIGHT	2,350 lbs.
ENGINE	175-hp, "Power-Geared" Continental

All Performance Figures Are Based on Gross Weight

72

Take the measure of the exciting new 172 and you'll see how much more you can expect and get in '61! For instance, the 172 provides a new fuselage that incorporates a new, more streamlined windshield . . . all-new engine compartment . . . a new, longer, wider, lower look — (three inches lower) . . . a roomier instrument panel for "eyes-on-the-road" operation. . . new fashionably elegant interiors . . . a new, outside baggage door for easy loading and unloading. And the 172 has a "spacious-for-four" size cabin for stretch-out, move-around freedom . . . high-wing stability . . . Para-Lift flaps . . . Land-O-Matic gear . . . Continental O-300-C engine for years of dependable, thrifty operation (the same engine that powered the 172 to two world's non-stop endurance records) . . . and a host of other features . . . all unparalleled in the low-cost, four-place, full-size class!

SEATING CAPACITY	Four
MAXIMUM SPEED	139 mph
CRUISE SPEED	130 mph
MAXIMUM RANGE	790 miles
RATE OF CLIMB	730 fpm
TAKE-OFF RUN	780 ft.
LANDING ROLL	680 ft.
SERVICE CEILING	15,100 ft.
BAGGAGE CAPACITY	120 lbs.
GROSS WEIGHT	2,200 lbs.
ENGINE	145-hp Continental

All Performance Figures Are Based on Gross Weight

HAWK

There's big, big news in '61! For the first time, the 172 has an upper classmate. The Skyhawk. A distinctive, new, deluxe version . . . featuring all the great benefits of the 172 . . . plus such key feature standouts as a new engine-driven vacuum pump . . . new, all-electric, push-button starter on the O-300-D Continental engine . . . a complete set of gyro and primary flight instruments . . . and your choice of six fully painted flight/sweep selections! — And the deluxe equipped Skyhawk is loaded with other extra equipment normally optional on most airplanes! The Skyhawk is a prestige and value-packed standout in the low-cost class.

SEATING CAPACITY	Four
MAXIMUM SPEED	140 mph
CRUISE SPEED	131 mph
MAXIMUM RANGE	790 miles
RATE OF CLIMB	730 fpm
TAKE-OFF RUN	780 ft.
LANDING ROLL	680 ft.
SERVICE CEILING	15,100 ft.
BAGGAGE CAPACITY	120 lbs.
GROSS WEIGHT	2,200 lbs.
ENGINE	145-hp Continental

All Performance Figures Are Based on Gross Weight

How much? You can move — wherever, whenever you please at the rate of two to four miles a minute . . . aboard your choice of 12 great new Cessnas for '61! . . . the best, most complete assemblage of balanced business airpower in the history of business aviation! You can explore and expand with a 10-to-1 maneuverability advantage . . . plotting your plans in practical, easy steps . . . selecting any one of the additional 5,400 Cessna profitports which lie, in all directions between the cities now served by commercial airlines! Aboard a Cessna, you can set your own schedule . . . actually gain a big head start on your competitors, in finding, developing, and serving new markets . . . in supervising field operations . . . in conserving and utilizing travel time, expense, and energy! It's the profit-proved way to leave competitors . . . and travel problems far behind.

FREE VPM ANALYSIS— With the answers to six simple questions, your Cessna dealer can provide a Value Per Mile Analysis for your company. You can actually see **how little** it costs to travel farther and faster in your choice of 12 Cessna's for '61 and **how much** extra power, performance, and progress you can **expect and get.** Ask your Cessna Dealer for a free VPM Analysis, now. No obligation.

FINANCING — Your choice of 12 new Cessna's for '61 are as easy to **buy** as they are to fly!...for Cessna dealers offer a convenient, practical plan for financing . . . a program designed to provide fast, simple, pre-planned financing service. See your Cessna dealer for the details, and terms, of a financing plan which will put you out front, keep you out front — to stay . . . in a Cessna for '61. Lease plans are also available.

RENT-A-PLANE — If you want to test the profit-proven benefits of a Cessna before you buy . . . if you're looking for the link to make an important travel connection . . . or if you simply want to fly for fun . . . remember, you can rent a plane just like you rent a car! Fly yourself or with pilot provided. Call your Cessna dealer for complete details.

COOPERATIVE OWNERSHIP — If your individual needs do not presently justify sole ownership of the Cessna of your choice, ask your Cessna dealer about group ownership. He'll give you the full details of the popular associate plan for cooperative airplane ownership . . . a practical plan which permits small groups to pool their private air travel budgets in order to economically participate in the progress . . . and fun of flying a Cessna for '61!

LEARN TO FLY AS YOU TRAVEL — Your Cessna dealer has a flight training plan to fit your every-day schedule. Most popular is the "Learn-to-fly-as-you-travel" plan. You can actually take "on-the-job" flight training during business trips! Your Cessna dealer can also arrange an "after-five" and weekend schedule of training, too. And when you solo, your Cessna dealer will present you with a "Cessna Solo Trophy," a clever and handsome piece you'll be proud to put on permanent display in your trophy case, at home or in the office!

"GOLDEN RULE" WORLD-WIDE SALES AND SERVICE — Wherever you go you'll be only minutes away from the Cessna "Golden Rule" service. When you see the Cessna dealer's red and blue pennant shield of service . . . it's a sure sign that your service needs will be handled expertly, economically, and efficiently by factory-trained service technicians — and that you'll get prompt, courteous attention. Across the nation . . . around the world . . . look for the red and blue pennants, the sign of Cessna Golden Rule Service!

ALL AROUND THE COMPANY / Everyone . . . executives, salesmen, production men, field supervisors, new business development men, maintenance and repair personnel, technicians and service representatives, advertising and sales promotion men, purchasing agents . . . and countless others . . . are finding that you can count on Cessna to conserve time, energy, and money. Savings that can be converted to greater success! Here's some of the reasons why: . . . World famous, proven Cessna "go wherever, whenever" flight performance eliminates costly waste of man hours unproductively spent in public transportation waiting rooms or in fighting the energy-draining battle of surface travel congestion. Manpower does double duty . . . with less energy expended . . . when a company adds the proven Cessna plus to its transportation fleet. Fewer men do a bigger job in less time with a Cessna . . . Cessna mobility, range, and speed shave out-of-town . . . out-of-pocket expenses caused by extra meals, lodging expenses. You get there and back sooner in a Cessna . . . and there's no extra fare for extra passengers. Rugged, dependable Cessna construction reduces maintenance costs . . . creates long-life and slow amortization of the low initial cost. Design refinements provide amazing fuel efficiency that literally squeezes extra "go" from every drop of fuel! The Cessna of your choice is the biggest business air travel bargain package offered in the industry! Why wait. See your Cessna dealer . . . NOW!

Cessna®

AIRCRAFT COMPANY

WICHITA / KANSAS

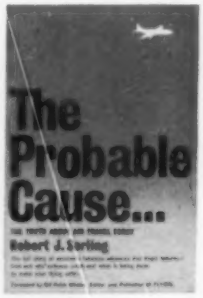
LITHO IN U. S. A.

HAVE YOU READ?

By JAMES F. SUNDERMAN

THE PROBABLE CAUSE: THE TRUTH ABOUT AIR TRAVEL, by Robert J. Serling (Doubleday, 575 Madison Avenue., New York 22, N. Y., $3.95).

This book is many things. It reads like a novel, teaches like a learned professor, documents an historical record of commercial air tragedy, unravels in clear terms cause, result and correction like a Scotland Yard detective.



Serling has performed a monumental job in recreating the history of American commercial air disasters. He analyzes the probable causes, studies the investigation process, follows in minute detail the various theories advanced. He lets the chips fall where they belong, on aircraft or instrument malfunction, structural fault, pilot error, weather, incompetent design or construction, improper airways control or airport facilities, overregulation by federal agencies, and others.

For every major type of disaster, Serling has an example in dramatic phrase and follows it through to the CAB investigation and official verdict. Some are real cliffhangers.

On the ALPA-FAA feud he is quite objective, patrolling both sides of the street. There is nothing all white, all black, and Serling's plea for some solution to this deadlock is based on conviction that greater progress in the knotty area of air safety is only possible when good faith is shared by all parties.

There is an old military axiom, if you know your position you can beat your enemy. If those responsible in America, and that includes about all of us, understand this bogey, we need have little fear for our welfare in the air.

FIRST OF THE SPACEMEN: IVEN C. KINCHELOE Jr., by James J. Haggerty Jr. (Duell, Sloan and Pearce, 124 E. 30th St., New York 16, N. Y., $3.50).

On May 2, 1956 AF Captain Iven C. Kincheloe flew the North American rocket-powered X-2 to a record 126,000-ft. altitude, a mark for manned flight that would stand for more than two years and which culminated a distinguished record of test flying that earned Kincheloe the coveted Mackay Trophy.

"Kinch," as his friends knew him, had flown just about everything the Air Force had, from the hottest experimental jet to lumbering multi-engine cargo planes. He had been earmarked to take the X-15 beyond the fringes of the atmosphere, but on July 26, 1958, his F-104 flamed out on takeoff and the great engineer-flyer was killed. Ironically, his AF successor to the X-15 slot, Maj. Bob White, broke the Kincheloe record on August 12, 1960 when he took the X-15 to 136,500 feet.

"Kinch" came close to representing the epitome of a modern rocket and jet test pilot; a graduate aeronautical engineer; double jet ace from Korea; a nerveless, calculating, precision man in the cockpit; tall, handsome, athletically built with a keen, alert, observant, sensitive mind.

Haggerty traces his brilliant career, an exemplary story of an aerospace pioneer the aviation world will not want to miss.

THE AIR FORCE BLUE BOOK, Vol. II, edited by Tom Compare and William P. Vogel Jr. (Military Publishing Institute, 55 W. 42nd St., New York, N. Y., $1.50).

This new revised, updated reader-reference to American aerospace power contains over 30 narratives on every facet of Air Force operations missions, personnel, equipment and installations. Half the book contains a comprehensive almanac of fact and photos, as thorough and authentic an accumulation of handy finger-tip reference items, current and historical, as can be found between two covers. In attractive pocket-size, paperback form, it is a desk item for home, office, shop, school and library.

THE BIG EIGHT: THE BIOGRAPHY OF AN AIRPLANE, by Richard Hubler (Duell, Sloan and Pearce, 124 E. 30th St., New York 16, N. Y., $5.00).

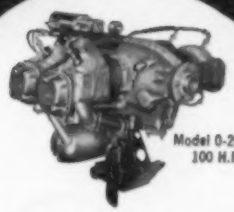
For a non-flyer, Richard Hubler writes about aviation and flight with a penetrating feeling and depth. Few authors can pack as much fact and meaning into word arrangement. He has scored again with this story of a magnificent aeronautical achievement, the chronicle of the Douglas DC-8 jet transport from its conception through design, construction, test, and airline operation today.

About half of the book traces the Douglas aircraft story from its origins in the immediate post-WW I period when the historic Douglas World Cruiser (first to circumnavigate the globe in 175 days—388 flying hours) took shape in a small, cramped Wilshire Boulevard plant in Los Angeles.

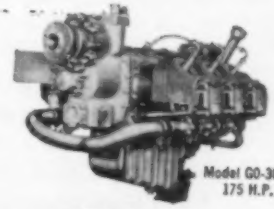
The line of Douglas aircraft, civil and military, is long and distinguished. Planes like the DC-3 at one time carried 95 per cent of all commercial air traffic, provided the workhorse of the military in WW II, the DC-4 which began ocean spanning; and the DC-7 which made flight intercontinental; the X-3 experimental rocketship which helped explore the speed frontiers.

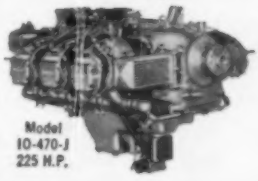
It all piles into a mountain of experience, know-how, and engineering ingenuity now found wrapped up in the DC-8 jet. The story of the DC-8 is that of a whole new airplane with a proud heritage, and it provides fascinating reading.

CONTINENTAL AIRCRAFT ENGINES



PROGRESSIVE ENGINEERING AND QUALITY MANUFACTURE, PLUS THE BACKING OF ESTABLISHED WORLD-WIDE SERVICE, MAKE CONTINENTAL FIRST NAME IN UTILITY PLANE POWER





Continental Motors Corporation
Aircraft Engine Division
MUSKEGON, MICHIGAN

Now You Can Stop Wishing... Now

SENSATIONAL NEW PIP

WORLD'S FIRST "COMPACT" OF THE AIR WITH COMPACT PRICE... COMPACT ECONOMY... AMAZING FLYING EASE AND SAFETY... TWO-MILE-A-MINUTE SPEED... BIG PAYLOAD

Piper Colt!...biggest news in private flying since the first Cub was built. **Piper Colt!**...the plane aviation's long been waiting for.

Piper Colt!... a speedy, load-carrying, cross-country airplane, designed with gentle flight habits for the beginner, at a price most people can afford . . . priced at less than half the cost of almost all other airplanes . . . priced at a sensational $4995.

Compact price, compact economy, but *big* performance and usefulness; 120 mph top speed, 115 mph cruise, less than six gallons per hour consumption, 100-pound baggage capacity! Perfect for sportsmen pilots, ideal for many business travel needs, unmatched for flying club use, and a sure money-maker for flight service operators.

And you'll find dependability built-in all over the Colt. Many parts and components benefit from years of design perfection in the famed Tri-Pacer. The 108 horsepower Lycoming 0-235 engine is known to veteran flight operators as one of aviation's finest powerplants.

See the Colt at your Piper dealer's. Study the economical finance plans, with low monthly terms. The Colt was made for you, your flying club, or your flight line.

WRITE FOR COLT BROCHURE, Dept. G-1

PIPER AIRCRAFT CORPORATION

LOCK HAVEN, PENNSYLVANIA

You Can Start Flying Your Own Plane!

ER Colt 108

IF YOU'RE AN OPERATOR

The Colt's for you. Perfect for flight training, safe and docile for solo and rental, ideal for low-cost, single-passenger air taxi trips that will attract business and make you a profit. Lycoming 0-235 dependability and economy you know can't be beat. And Piper offers a special Colt Promotion Kit and Program that will help you get new student business, new charter work, new plane prospects, new business all around. Let the Colt give your operation a pleasant, profitable jolt. Talk turkey today with your Piper distributor.

A REAL LOAD-CARRYING 2-PLACE AIRPLANE

Standard Colt carries full fuel (18 gal.), two 170-lb. passengers and has 250 lbs. of additional useful load.

Super Custom Colt—complete with full IFR instrumentation, Piper AutoNav radio compass, Narco Superhomer with Omni and two-way VHF, landing and navigation lights. Carries two people, 36 gallons (with optional 18 gal. tank) *and* 72 pounds of baggage!

BIG BAGGAGE SPACE

Big baggage area (100-pound capacity) makes the Colt ideal for farmers, vacationists, salesmen, air taxi operators. Roomiest cabin of any two-place, side-by-side airplane, too.

PIPER Colt

MORE PEOPLE HAVE BOUGHT PIPERS THAN ANY OTHER PLANE IN THE WORLD

With a great price

GILL ROBB WILSON
Publisher

AS THIS is written, I have borrowed a pen from a stewardess and am using the flyleaves of Steve Tillman's book, "Man Unafraid" to set down these words.

We are cruising at 31,000 feet and making good some 560 mph, according to the captain—commuting between the coasts as is our wont. Literally we must write "on the fly." These jets have a way of tricking us. They have made travel so swift and painless that unconsciously we multiply our engagements and thus put ourselves under pressure greater than ever.

But perhaps up here is as good a place as any for an aviation publisher to meet a deadline. And heaven knows the time is conducive to thought—a new year in the offing, a new decade in its dawning and a new national administration in the forming.

As usual, I have looked up and down the aisles at my fellow passengers. There is no trace of concern on any face, no light of adventure in any eye. It warms the heart of an old pilot to see how confident and comfortable they are. On the other hand I wonder a bit nostalgically if any one of them gives a thought to what a price has been paid for his or her privilege.

For every second of the time we flash between the Atlantic and the Pacific a pilot has died to pave the way. For every mile we traverse, the airmen have flown a thousand hours to test and prove the techniques and the machines. For every feature of safety and dependability we enjoy, hundreds of young men have paid in the sweat of exhaustion and danger.

It is not that I crave credit for the hosts of comrades who march across memory as we flick above the prairies, the mountains, the rivers. They freely chose their way of life and in that choice lay their reward. But it seems to me that they who have no sense of heritage, no thought of the faith and courage and dedication which underlies their privilege, have missed something of great joy, of deep happiness. I'm sure that this consciousness of heritage rides with almost every pilot who has pushed a throttle, and accounts for much of his or her devotion to the profession.

Perhaps it is a fair question—have we, not merely as passengers in a luxurious airplane but in a luxurious country, lost something of our sense of heritage and so of our joy of living?

During the recent national election day, although it was a much heralded occasion, some forty million of us did not vote. And this in an era when the privilege of the citizen to vote freely and secretly is the symbol of his or her "life, liberty and pursuit of happiness."

Also I noted both on election day and on Veterans' day shortly thereafter such a paucity of American flags in the breeze as might have indicated I was in "enemy country." How could this have been possible if consciousness of our heritage as citizens had been strong in our breasts? Will deadly bombers and missiles, which can not be intercepted, constitute enough security that we can afford to disregard our personal devotion to the land of our birth or adoption?

I may say bluntly that I am not of the school which chatters and palpitates every time the Kremlin takes off its shoe and pounds a desk. And furthermore, I could scarcely care less what price prestige. Neither the Soviet Union nor the tin-cup politicians will in the ultimate destroy the United States. That momentous task is the prerogative alone of the American people. And they will not exercise their prerogative deliberately but well may do so in a decaying preoccupation with lesser and less worthy objectives. So I care with every fibre of my being what the American people think of themselves. Their heritage is a source of their peace of heart and tranquility of mind. Without these things the pursuit of happiness is a cruel dream.

Our recent election was indecisive of any mandate to the new administration. The young man who assumes the office of Chief Executive is thereby in a most difficult position.

Many a lonely decision must be his if he walks in the line of great predecessors. He will be watched as critically, even more so, by his own partisans than by his opposites in political philosophy. And this is the way of American politics.

But that is not the end of the matter. We of the masses, divided almost evenly in our votes, must now be undivided in our hopes, our help, our prayers in his behalf. Ours is a heritage of democracy and we can afford no indifference of our heritage despite that our partisanship is indifferently served.

If the young man who is to become our President can restore our sense of manifest destiny, our consciousness of the things which made us great, our faith in ourselves and in God, he can forget the question of our prestige. We need inspiration at home—not approval abroad. We were bought with a great price. That is our strength.

THE AIRESEARCH GULFSTREAM COMPLETION PROGRAM

This extensive completion program at AiResearch Aviation Service for Grumman's new prop-jet corporate transport includes: custom business interiors . . . soundproofing . . . radar . . . radio . . . autopilot . . . instrumentation . . . paint . . . maintenance.

AiResearch personnel have been factory trained for this special program. Expert craftsmen utilize the newest materials and processes in building and installing lightweight, fully stressed furniture, lounges, galleys, lavatories and other appointments custom designed for the individual Gulfstream purchaser.

Our acoustical engineers have developed three individual degrees of soundproofing installations for the Gulfstream to insure the comfort level you desire. And our highly experienced, well-equipped radio and electronics departments design and execute the most modern installations.

By using a full-scale mockup of the fuselage section we are able to prefabricate components for the Gulfstream to expedite delivery time. And AiResearch guarantees the completion weight of your aircraft.

AiResearch has more experience in pressurized aircraft than any other modification center.

Write, wire or telephone for complete information, including brochure, on the AiResearch Completion Program for the Grumman Gulfstream.

Grumman Gulfstreams undergoing a custom tailored completion program at the AiResearch Aviation Service Company facility.

THE GARRETT CORPORATION

AiResearch Aviation Service Division

International Airport, Los Angeles, Calif. • Telephone: ORegon 8-6161

The Future of VTOL Aircraft

THE 1960s are going to be a painful selection period for VTOL (vertical takeoff and landing) aircraft in the United States. Most of the vertically rising aircraft tested successfully during the 1950s will have to be abandoned during the next decade.

This elimination process is sure to come despite the fact that the VTOL engineering problem has been conquered and there are several demonstrated ways airplanes can be made to take off and land vertically without using helicopter-type rotors. A wide variety of VTOL aircraft with tilt-wings, tilting rotors, rotating engines, and many other unique features have been proven feasible beyond a doubt in recent years through flight test programs. These experimental aircraft are undeniable engineering achievements. And they have added greatly to the knowledge of safe, controllable flight at slow speeds as well as to the design of lightweight shafting and gearing needed to connect multiple engines on such aircraft for safe engine-out landings and takeoffs.

In the overall view, however, these engineering achievements are dimmed by a general displeasure and uncertainty over the VTOL program in the military services and in industry. Three main complaints can be heard today about the management of the VTOL program during the 1950s:

- **Piecemeal spending of money**—More than $100 million have been spent in 10 years on research and development of VTOL vehicles other than helicopters by the Army, Navy and Air Force. However, no large portion of this substantial sum has been available at any one time, and it has been spread over about 20 different aircraft development projects. As a result, no project moved as rapidly as it could have.
- **Development of only research airplanes**—No money has been spent to go beyond the first generation research aircraft with any type of VTOL. No improved or "optimized" second generation aircraft have been built to take advantage of the knowledge gained with the first aircraft to prove exactly what a good VTOL is capable of.
- **No operational testing**—None of the VTOL research aircraft has ever been taken into the field in an operational test program to simulate its use by troops in combat. Some of the major questions about the operational utility of VTOL aircraft such as the effect of dust clouds raised by high downwash velocities have never been subjected to a field test.

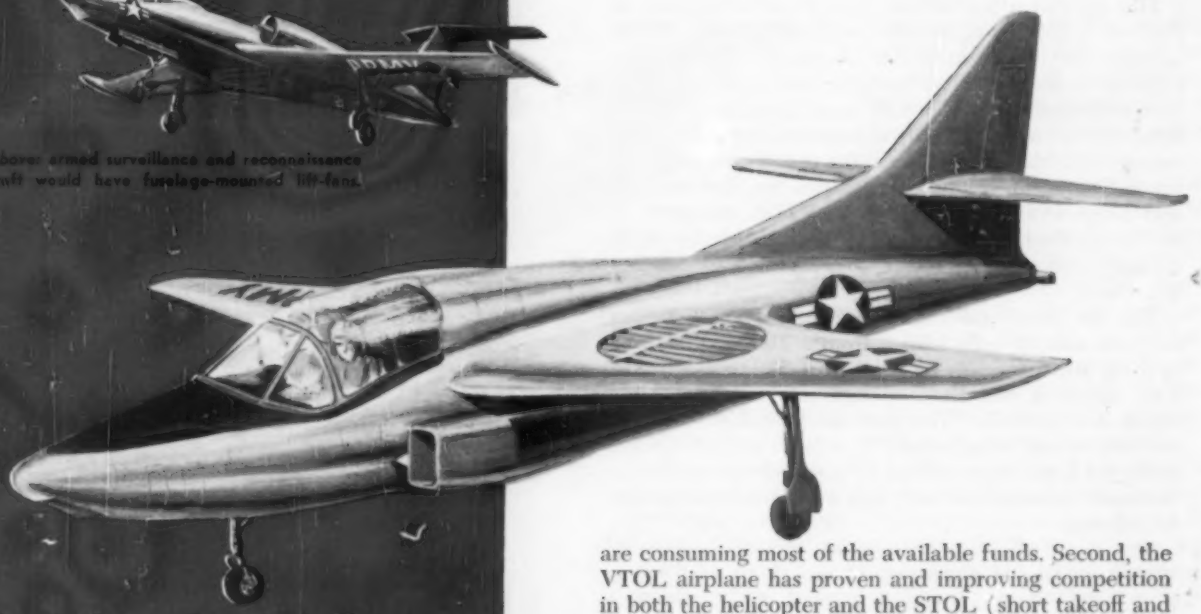
These opinions almost universally are held by the military officers who have worked and fought for VTOL aircraft during the 1950s. They see these aircraft as an absolute necessity in any future war so that the Army can be truly mobile and will not be tied to the road system for its supply.

These opinions also are held emphatically by the designers of the current crop of VTOL research aircraft. One of the principal benefits of the investment the government has made in VTOL in the past 10 years has been the nurturing of several groups of independently thinking and fiercely competitive designers. In a way these men can be called the hungry men of aviation because they have invariably carried on their work with low budgets reminiscent of the 1920s. The tech-

Left: General Electric lift-fan engine with test model in successful wind tunnel trials.

Above: this proposed Army VTOL/STOL assault transport has lift-fans located in the wings.

Above: armed surveillance and reconnaissance craft would have fuselage-mounted lift-fans.



Above: two-place surveillance aircraft with lift-fans would carry cameras, electronics.

Though research aircraft have proved the feasibility of the VTOL concept, progress toward operational models still lags.

By J. S. BUTZ JR.

nical stature and ability of these designers has grown and today few of them have abandoned faith in their particular approach to VTOL for at least some missions. Therefore there are several basic approaches to VTOL design available today with insistent spokesmen boosting each approach. And these spokesmen are equipped with the flight test data to back up all their arguments.

Even the most rabid VTOL supporter, however, sees little chance of a rapid development program to bring even one type of VTOL airplane to operational status. Two of the main facts of life in 1961 are completely against it. First, the cost of all types of engineering development work is increasing rapidly and space work, missile development and high-speed aircraft projects are consuming most of the available funds. Second, the VTOL airplane has proven and improving competition in both the helicopter and the STOL (short takeoff and landing) transport airplane for military and commercial use.

Few people will deny that there is a place for the VTOL airplane, which combines the vertical rising ability of the helicopter and the high speed of the conventional airplane. There is wide opinion among technical leaders, however, that it will not be economically justifiable for many years to go into the full-scale development of either military or civilian VTOL aircraft. This is the position taken by the top engineering authorities in the Department of Defense. In short, this means that the VTOL enthusiasts' dream of a VTOL airplane in every garage, or at least in every downtown area—which did not come true during the 1950s—probably won't materialize during the 1960s.

A definite VTOL development program has now been inaugurated by the Department of Defense along the lines recommended by the office of Dr. Herbert F. York, former Director of Defense Research and Engineering. Dr. York's policy recommendations have been to give VTOL development a low priority, but to consolidate the efforts and funds of the three services into the construction of a second generation VTOL transport that could be tested under field conditions.

Under the DOD plan, approved by John H. Rubel,

acting director of Defense Research and Engineering, the Navy will provide a manager for the mutual effort to produce a prototype VTOL transport, designed to meet the combat requirements of the Army, Navy, the Marine Corps and the Air Force. Each service is to contribute to the specifications that were agreed upon.

Envisioned is a prototype weighing 35,000 pounds, capable of carrying a four-ton payload. It would have a 1,500-mile range and speed of about 300 knots. Estimated development cost: $70 million.

One of the major effects of this new policy of combining the efforts of the services, at least for the present, has been the abandonment of Army and Air Force plans for operational VTOL weapon systems in the period 1965 to 1967.

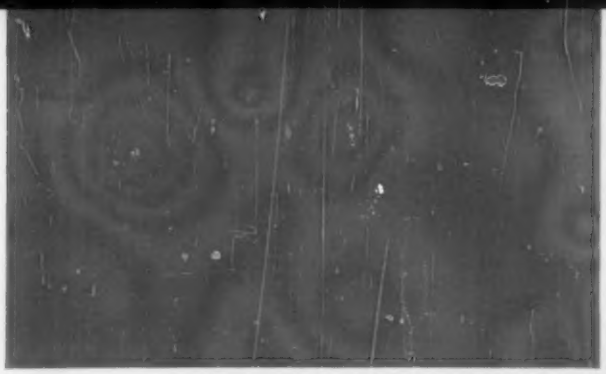
The Air Force had active plans at the beginning of the year to develop an operational Mach 2 VTOL fighter airplane for the Tactical Air Command. These plans have been abandoned as too expensive and too ambitious technically. Operation of large numbers of VTOL fighters from widely dispersed positions instead of from normal airfields would increase the cost of running TAC several times. It would also require the development and large scale production of a VTOL transport to service the dispersed fighters. Pentagon authorities ruled against implementing such plans for at least another five years.

The Air Force now intends to build a STOL fighter that can take off fully loaded from a 3,000-foot runway and fly supersonically at less than 500-foot altitude. This means it will have enough power to go nearly Mach 3 at altitude. The airplane probably will have variable-sweep wings, which have been under intensive study for better than a year by research groups at the National Aeronautics and Space Administration and in industry.

The Army also considered ordering an operational VTOL airplane to replace the Cessna L-19 Bird dog as its standard close observation aircraft. After consulting all the experts in the field from the government, industry and educational institutions, it was decided that the Army would get the most for its money by buying a new two-place helicopter designed with the latest state-of-the-art information. Serious consideration of a VTOL airplane for the Army was delayed at least another two years.

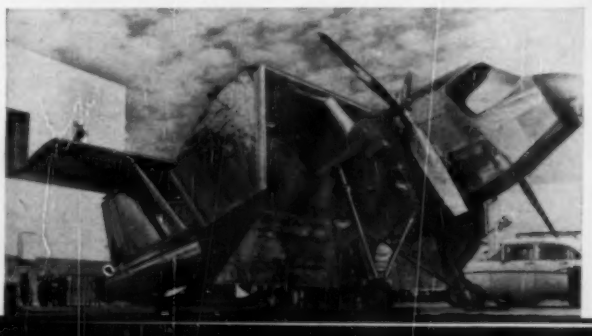
One of the major problems in getting a combined, three-service development program going on a VTOL transport for field and operational testing is to decide which VTOL system to use. Naturally, there has been a furious technical debate over this point. It seems probable after considering the public statements of designers, military officers and Pentagon officials that this craft will be a compound helicopter, which is also known as an unloaded rotor aircraft and a convertiplane.

The general idea was pioneered by Doblhoff in Austria during World War II and two principal aircraft of this type have been built and flown since that time, the Fairey Rotodyne in England and the McDonnell XV-1 in the United States. The Rotodyne is still under development and is scheduled to enter airline service in the early 1960s. There hasn't been much flight work with the XV-1 for some time, although preliminary design groups in the United States have given



Above: Hiller X-18 with contra-rotating props demonstrates wing-tilt configuration for vertical and transition to level flight.

Above: Fairey Rotodyne compound helicopter has rotor blade jets.
Below: Ryan Vertiplane with deflected flaps for VTOL performance.



The Bell X-14 features a deflected-jet type of propulsion system.

McDonnell XV-1 with pusher propeller is a compound helicopter.

Four-prop Fairchild VZ-5Fa has deflected flaps and a tilt-wing.

Doak 16—Army VZ-4da with ducted fans that rotate 90 degrees.

Tilting rotors are combined with a fixed wing in the Bell XV-3.

serious consideration to the compound helicopter in recent years. There is justification for this interest.

Compound helicopters have a rotor and a small wing with enough area to support the aircraft at cruise speeds. When cruising, the power is taken off of the rotor and applied to a propeller or jet exhaust to provide forward thrust. The rotor then turns at low rmp, providing only slight lift. Cruise drag of the airplane with unloaded rotor and the wing is less than the drag of a comparable helicopter on which the rotor is used to provide lift and forward thrust. Speeds of pure helicopters are around 125 mph, while compound helicopters can boast an increase in speed up to the neighborhood of 175 mph.

Two of the main technical problems with compound helicopters are:

- Adverse effect of the cruising wing on the rotor downwash during vertical takeoff and landing. Rotor lift changes significantly as it passes over the wing and vibration occurs.
- Mechanical difficulties in transferring power from the rotor to the propulsion units for forward flight. In both the XV-1 and the Rotodyne the rotor is driven with small jets on the rotor tips. Hot, high-pressure air for these jets is supplied by compressors in the fuselage and ducted out through the blades. Fuel is then burned in the tip jets. Propellers then are used for forward flight. It is also possible to use mechanical linkages to drive the rotor, to use pure jet engines and other power for compound helicopters.

An additional problem with compound helicopters is the noise from the rotor tip jets. Most designers regard these jets as the most effective power units for the rotors because they are lightweight and they eliminate the need for a torque-compensating tail rotor. However, when fuel is burned in jets the noise level is high enough to be of concern even to the military. It may prove to be an insurmountable obstacle for the commercial operations of such vehicles from downtown areas or even airport terminals. Suppressing the noise reduces power toward the cold jet condition when rotor power is provided by high-pressure gas ducted from the fuselage without any tip burning. The most efficient and competitive compound helicopters will use tip burning.

Choice of the compound helicopter as the first VTOL development vehicle appears for several reasons. The most important of these are:

- Majority of technical opinion in the United States among experts from the military, industry, government research agencies and universities is that the compound helicopter can be built more quickly than any other type VTOL vehicle. Detailed technical knowledge concerning this vehicle is more complete because it uses a rotor system similar to that of the helicopter.
- Downwash velocity of the flow from the large rotor on a compound helicopter will not be much larger than the flow from a conventional helicopter. This velocity will be less than 100 knots or hurricane velocity. The designer expresses this in terms of disk loading (total weight of the aircraft divided by the area covered by the rotor as it turns), and the (*Continued on page 94*)

ARE THE

Above: At the wheel control in the gondola the pilot heads a blimp east and over the Atlantic on a training mission. The non-rigid blimp can remain on station for protracted periods of time, is capable of riding out stormy weather. *Right:* K3 blimp landing on an aircraft carrier.

By LOU DAVIS

HAVE LIGHTER-THAN-AIR craft seen their best days? Airshipmen and lighter-than-air proponents say no. They are confident of the capabilities and role of "LTA" in the space age. Although they differ as to the shape of the vehicle that will evolve, there is agreement that adequate financial support for research will be able to resolve the differences.

FLYING set out to report the story as the airship and free-balloon craftsmen see it. Since the U. S. Navy is the traditional custodian of lighter-than-air craft, the search is confined to the men in Navy blue. And, since Lakehurst, established in 1921, is the historic berth of the airshipman, the rundown begins with a visit to this New Jersey base.

At Lakehurst today, the predominating sounds are from helicopters, not airships. Naval reserve anti-submarine aircraft busy the scene over the weekends. What remains of the once proud airship fleet—of non-rigid balloons—occupies a quiet place in the background scene. Free balloons are no more. All too infrequently observers have a chance to see blimps take off or land at this historic port.

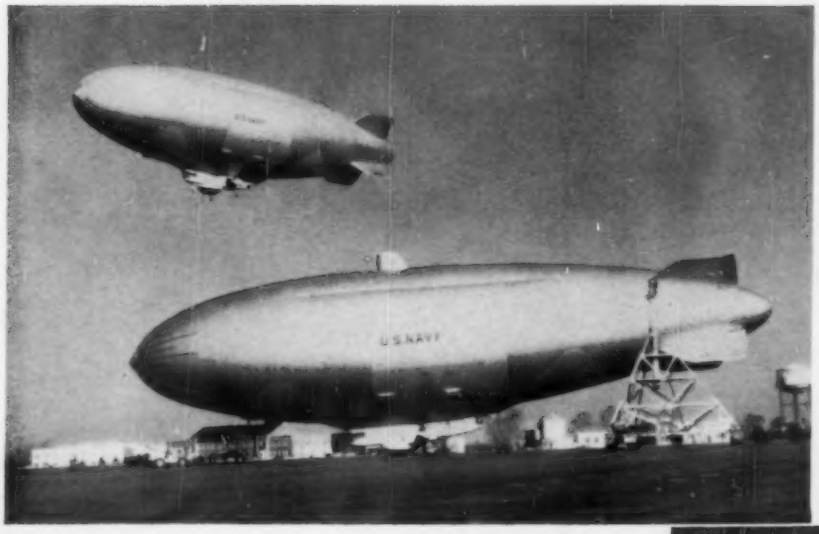
Despite the present questionable place of the airship in the missile age, a small but proud corps of men is still fighting to re-establish its place in the sun.

The historic naval base, whose walls are filled with faded pictures of such famous dirigibles as the von Hindenburg, Graf Zeppelin, Akron, Macon, Shenandoah, Los Angeles and others, is situated about 20 miles inland from the Atlantic Ocean, near Point Pleasant, N. J. Its giant airship hangars and relics of those glorious days provide the current airshipman with inspiration and ammunition to energetically promote the blimp's cause.

Number one champion is Capt. Henry M. Eppes, commander of the base, which was his first duty station, in 1937. His message vigorously disputes the idea that the airship is dead, "even though Washington has ignored its needs for years." The drive into space and the special requirements of the nuclear submarine and missile armament systems will bring the "old girl" back into prominence and use, according to Capt. Eppes.

"Its immediate mission, anti-submarine warfare (ASW), and early-warning search missions (AEW), will be expanded," Capt. Eppes asserted. "Most everyone in the Navy agrees it is impossible to design planes which ideally will perform both ASW and AEW duty.

BLIMPS THROUGH?



No, argue the airshipmen who see expansion of present role and future space-age missions made feasible by enlightened support for lighter-than-air type craft.

Left: Blimp ZPG-2W makes ready to take off at its Lakehurst, N. J., base while ZPG-2 circles overhead waiting its turn to land. *Below:* Blimp ZS2G-1, attached to mobile mooring mast, leaves dock Number 1 at Lakehurst. This dock now is used to store heavier-than-air craft.

Only the airship does both within acceptable limits."

Capt. Eppes supports this view by citing demonstrated excellence of the airship in maintaining fixed patrol in assigned areas for long periods of time; its ability to operate safely in rough weather; to work close to the surface and to provide all-weather visual reconnaissance; and to re-supply and refuel at sea by means of floating fuel cells, ships or aircraft carriers.

Heavier-than-air opponents point to its slow speed and the relatively long time required for the airship to reach a distant patrol position compared with the faster heavier-than-air craft.

However, Eppes says, "The airshipman can afford headwind delays. Airships can occupy fixed positions for days beyond relief schedules while aircraft must work to close time limits. The non-rigid airship can stick it out in a storm and is less vulnerable to weather that sends planes and sometimes ships scurrying home for safety. Centers of thunderstorms or wet snows are the two special types of weather that require change of position—"otherwise, the airship can stick it out."

Eppes predicts: "The lighter than air vehicle will find new missions to perform that will more than justify money and design effort to (*Continued on page* 78)

"You're on your own" was all he said
that day long years ago—
So long his name and face are lost
in memory's afterglow;
Nor do I recollect of pride or joy
or doubt or fright
Or other circumstance which marked
that time for solo flight;
The cryptic words alone endure. He
said, "You're on your own,"
And down through time I've found it so
—the test's to walk alone.

Not that one choose to draw aside in
churlish mein or vein
From common lot of what life holds of
pleasure, toil or pain
But that the call's to rise and cruise
alone with dreams unshared
Or plan alone for some far goal for
which none else has cared,
Or fight alone for what you hold is
worth a warrior's strife
And ask no gain or fame or aught
beyond the joy of life.

I owe a quenchless debt to him who bade
me seize my fate
And hang it on the faith that I to it
was adequate
For when he said, "You're on your own"
and sauntered on away
I knew that here in four short words was
youth's first judgment day!
—Not wit to learn, not test of skill,
not pride to satisfy
But will to walk down life in faith that
life is theirs who try.

GILL ROBB WILSON

Engine power is boosted in the 1961 model. In addition the gross weight has been raised and the useful load increased to 1,270 lbs.

CHECK PILOT REPORT

BEECHCRAFT N35 BONANZA

By NORMAN JACOBSHAGEN

The N35 cruises at 195 mph at 7,000 ft. with 75 per cent power. Engine is a 260-hp Continental. Normal range with 45 min. reserve is 690 miles.

ADDITIONAL POWER, gross weight, useful load, range and window area are a few of the features that mark Beech Aircraft's new and improved 1961 Bonanza N35, first evaluated by FLYING at the company's Wichita, Kan. facilities.

The 200-mph-plus N35 is powered by the six-cylinder Continental IO-470-N rated at 260 hp at 2,625 rpm for all operations. This gives the Bonanza a 10-hp jump over last year's Model M35. Hydraulically controlled, variable-pitch propeller is made by Beech, and fitted with a company spinner and a Woodward governor.

Standard version of the all-metal, V-tailed aircraft embraces a four-place configuration. Basic cost is $26,500. Gross weight is 3,125 pounds, an increase of 175 pounds over last year's model. The useful load of 1,270 pounds drops to 1,253 pounds with addition of an optional fifth seat.

Let's take a close look at the N35. An unseen feature is the new, leading edge tanks of 25 gallons each. As optional equipment you can have two 40-gallon tanks. Each tank is filled at a single opening instead of at two, as before. Incidentally, a word of warning: If you have any idea that you'll want the auxiliary tanks, buy your plane with them installed at the factory. Trying to do it later involves tearing up the wing and becomes a pretty expensive item.

These new tanks, 10 gallons larger than in last year's model, increase the N35's range to 1,215 miles at 45 per cent of power at 10,000 feet, or 1,090 miles at 65 per cent and the same altitude. This is an increase over the M model of 90 miles in the first case and 135 miles in the latter.

While talking about fuel, we should note that this new fuel injection engine now demands 100/130 octane as opposed to 91 octane for the 250-hp engine of last year.

While the new airplane looks like all other Bonanzas, there are a few items that distinguish it from earlier models.

- Item 1: The rear window has been greatly enlarged. As good as visibility has been before, this new window gives almost the next thing to 360-degree sight around the airplane. I felt that it also imparts a greater sense of lightness and increased roominess.
- Item 2: Due to the construction of the new gas tanks, the landing lights are no longer located in the leading edge of the wing. One has been installed in the nose cowl just below the spinner. It also doubles as a taxi light. The other has been attached to the nosewheel strut and retracts along with the gear.

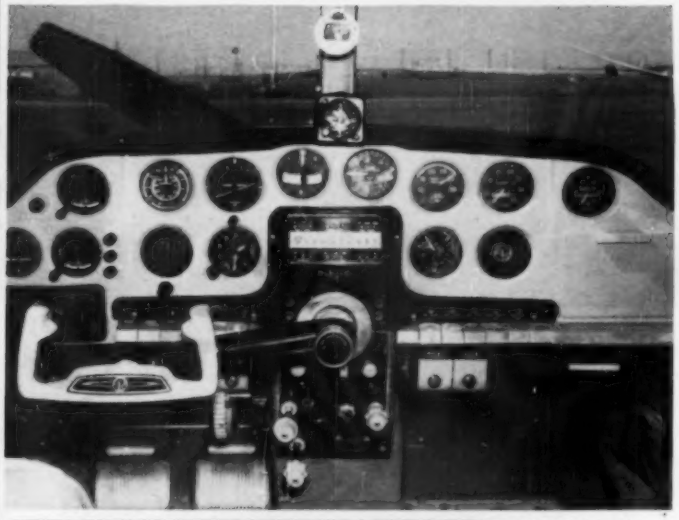
Looking more closely, we find that double spot discs have been incorporated in the brakes. Beech claims

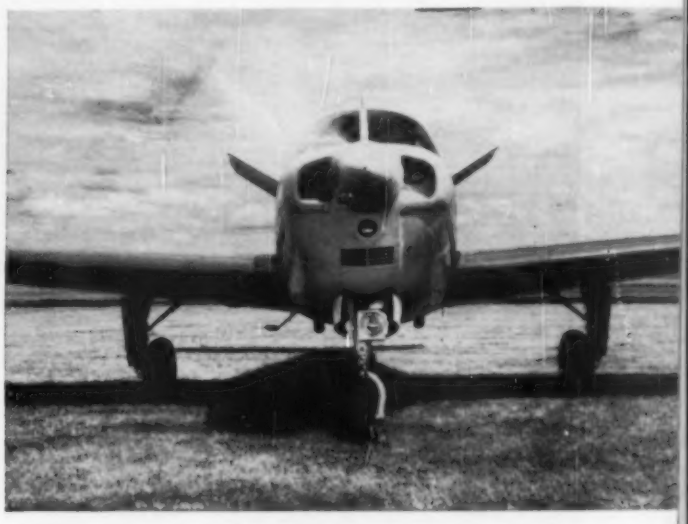
Left: the rear windows have been greatly enlarged, giving the pilot close to full circle visibility.

Left center: the push-button starter has been eliminated and the starter incorporated in key ignition.

Left bottom: back seats are individually adjustable; front seat reclines to provide chaise longue effect.

Below: landing lights have been moved from the wing leading edge to the nose cowl and nosewheel strut.





that stopping power of the Goodyear wheels is now even greater than last year in spite of the increased gross. Other easily overlooked identifying features are new and larger trim tabs. They now extend behind the trailing edge of the elevators to give increased trim power at low airspeeds.

You'll find in the interior of the N35 the same luxurious fabrics and plastics that owners have grown accustomed to in the past. A wide variety of color combinations (along with outside paint colors) should satisfy the most demanding. But something new has been added . . . a completely new back seating arrangement. There are now two individual seats, adjustable fore and aft with reclining backs.

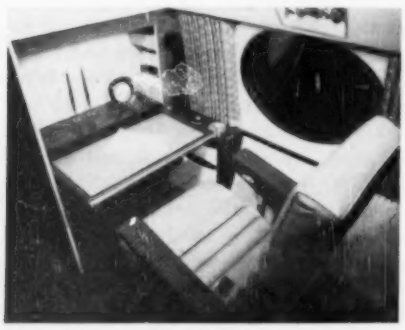
When they are in the full aft position, an amazing amount of knee room is provided. I'm sure even a six-foot seven-inch basketball player could sit comfortably without his knees hitting the back of the front seat. And when the back is reclined, you will discover what luxury really means.

An optional piece of equipment that will be of interest to the businessman who has his own pilot is a table top that can be attached to the back of the front seat. It will allow him to spread his papers so he can make his travel time double as working time.

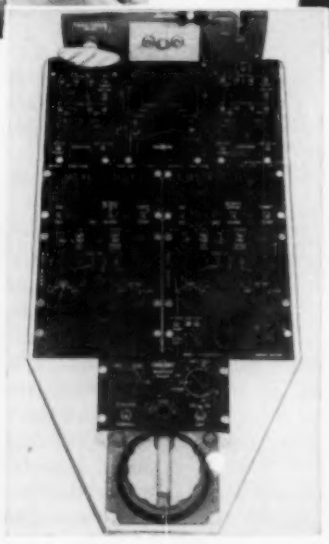
The instrument panel, too, looks very similar to past Bonanzas. Although it's been several years since I've flown one, I felt right at home. The one change of note is in the starter. The push button has been done away with and the starter incorporated into the key ignition as in most cars of today. My first reaction was that this might lead to starter gear ring trouble. It appeared to me that it would be too easy to engage the starter with the engine running. (*Continued on page* 102)

Two Rolls-Royce Dart engines give the Gulfstream a cruising speed of 350 mph. Range: 2,200 miles plus reserve. At 25,000 ft. cabin is pressurized to 5,500 ft.

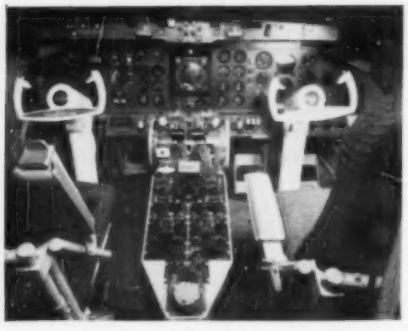
As many as 13 persons can be accommodated in the aircraft's "executive office seating" plan.



A slideaway desk, with swivel chair, is equipped with a phone and a receptacle for a dictaphone.



Above: Collins integrated flight system gives complete navigation and attitude information. *Left:* Panel between pilots with AP-103 automatic flight control system, radar, communications. *Below:* Cockpit layout showing radar in center of the instrument panel above throttle quadrant.



LUXURY AND UTILITY ARE PAIRED IN THIS EXECUTIVE TURBOPROP AIRCRAFT, FULLY OUTFITTED FOR ALL-WEATHER OPERATION.

Gulfstream by Atlantic

By GERALD J. SCHLAEGER

GRUMMAN AIRCRAFT'S Gulfstream needs little introduction. It has set a new standard for propeller-driven business aircraft; it has also presented new marketing problems.

Atlantic Aviation, Grumman's east coast distributor, has provided an unusual approach to these problems—in the form of a package program.

A new Gulfstream was fitted with the latest Collins electronic gear to place it in the all-weather category. The interior was finished with an attention to detail that would give "palpitations of the heart" to an air-minded executive anticipating its luxury and efficiency. An engine "loaner" plan was developed in conjunction with Airwork Corp. to provide usable engines during overhaul periods.

Entering the airstair-door just ahead of the port engine, you face the electronics compartment; it is concealed by an intricately designed, easily removable panel.

Turning to enter the main cabin, an enclosed flushing chemical toilet is on your left. This was placed forward to facilitate use by crew as well as passengers.

On the right is a well-equipped galley. An oven provides hot meals. Hot and cold water is available and there are adequate storage facilities.

The main cabin of the demonstrator, N285AA, is luxurious. Furnishings include a three-place divan, a desk and executive type chair. A tele-com to the pilot is on the fore wall with provisions for ship-to-shore radio as frequencies become available.

To the rear of the divan is a four-chair-and-table combination to facilitate in-flight conferences. Next to this is a long storage cabinet-FM-tape recording set by Muzak with a flip-out "kibitzer" seat to add a fifth party to the conference table. Speakers for the radio combination are hidden in the wall. Sliding-foldaway work tables are located on each side of the aisle at the rear of the cabin; each table serves two seats. All woodwork is rosewood or rosewood-patterned formica.

Behind the cabin on one side is a bar with adequate provision for ice, beverages, snacks and glassware. The bar itself has a novel fold-out arrangement which greatly increases the work area.

A spacious, finished baggage compartment is accessible behind the bar. An outside entrance is also provided.

The interior upholstery fabrics are provided in a variety of colors and styles for customers to choose from. The aircraft is literally a flying show room.

A deep pile rust-colored carpet covers the floor. The demonstrator ceiling is a soft off-white, highlighted by concealed and controllable fluorescent lighting. Additional lighting fixtures are in the air-return vent grills in the ceiling. Cabin height is 73 inches and length is 32 feet 8 inches.

As an emergency provision in case of in-flight pressurization failure, 22 individual oxygen outlets are strategically located in the cabin reading light-fresh air ventilator receptacles.

Atlantic chose an all-Collins electronic group because of the completeness and reliability of the line. It includes: the AP-103 autopilot, the FD-105 flight director system, the WP-101 weather radar with the bright tube indicator (no hood necessary), the 621A-2 transponder (radar identification), dual 17L-7 680-channel VHF communications transmitter, dual 51X-2 360-channel VHF communications receivers (880-channel model is available), dual VOR-101 VHF navigation systems (includes RMI), dual DF-202 automatic direction finding navigation equipment, dual MC-102 magnetic compass systems, dual 51V-2 glide slope (*Continued on page* 99)

A growing number of enterprises rely on charter flights as a major business aid. Airlines report millions of passenger miles added to operations.

AIRLIFTS FOR PRIVATE INDUSTRY

By LOUIS ALEXANDER

Above: some of the more than 5,000 dealers of Gibson Refrigerator Div. of Hupp Corp. in a vast jet airlift to Hawaii to preview appliances.

Left: theatre group off to Phoenix, Arizona, for the new play, Camelot.

RECENTLY 4,000 Americans—dealers in air-conditioning equipment and their wives—spent a week at Grand Bahama Island in the West Indies expense-free, including the round-trip by air from their home airports. Nearly a thousand others vacationed in Paris and another thousand, the "super-salesmen," spent 10 days in Israel.

It marked the tenth year that the Fedders Corp. offered free one-week vacations and round-trip flights to foreign resorts on chartered airliners to those dealers who did enough business to earn the flights. Extra points went to those who submitted their orders early for air-conditioning for the next season. In this way some dealers earned enough for two trips. On the second, wives were permitted to go along. Some super-salesmen earned enough for two trips to the Middle East.

The chartered airlift and the week's board and lodging for over 5,000 persons costs the Fedders Corp. well over a million dollars, a bill they cheerfully pay. Last year a similar bill for carrying and lodging 3,800 dealers and wives at Acapulco, Mexico, plus one for 600 super-salesmen who flew to Rome, Italy, resulted in such excellent sales and enthusiastic build-up in morale that the company believes the cost to be well worth while.

The air-conditioning dealer and his wife aren't the only ones who get expense-free flying vacations at resorts as rewards for good work. In the largest all-jet airlift in the history of commercial aviation, Pan Ameri-

Los Angeles Dodgers return home after one of the many charter flights that allow them to keep team schedules.

can Airways last September transported over 5,000 dealers of the Gibson Refrigerator Division, Hupp Corp., from 24 central pickup points in the continental United States to Hawaii. The mass airlift envolved more than 60 jet airliners, each accommodating up to 159 passengers. Many companies charter air trips as incentives to stir their dealers and salesmen into bringing in new business. The J. I. Case Co. holds its world premiere of new farm equipment at a different resort each autumn. Dealers drive the new tractors and try out the new combines while their wives sun, swim and shop. Automobile manufacturers have solved the problem of how top executives can answer the questions of dealers all over the nation and stir up enthusiasm among them, by flying hundreds of dealers into Detroit—or into Florida—for previews of new cars. And another farm equipment manufacturer, Deere and Co., airlifted retail dealers and their wives from small cities all over the nation on a week's round-robin trip through their factories in three different cities so they could see for the first time, all of the different products manufactured and sold by the company.

To the veteran air traveler such a trip might not seem attractive, but a company official reported, "To our sales winners from smaller towns a trip like this is an event. Here is an opportunity to combine a vacation with an educational tour to see tractors materialize as they move down the assembly line."

Mass airlifts aren't limited to businessmen and their wives either. One summer camp for children six to 17 years old avoided the jam at Grand Central Station, New York—and an interminable overnight rail trip—by flying its youngsters from New York to the Maine airport nearest the campsite in 85 minutes. Two months later they flew them back. The members of the Over-Thirty Club, whose favorite recreation is dancing, charter an airliner from Dallas to fly to an evening's dancing in San Antonio or Tulsa.

The Air Force Academy chartered a jet airliner to transport the Class of 1962 from Denver to New Jersey, where military transports airlifted them on a tour of air bases in Europe. Reporters and photographers followed Soviet government leaders around the United States in a jet airliner chartered (*Continued on page* 70)

SPERRY

INDUSTRIAL GIANT OF THE AIR AGE

Sperry, second from right, examines mechanism with son Edward, left, and Elmer Jr., right.

The genius of Elmer A. Sperry not only provided great impetus to the advance of aviation, but also showered significant benefits on many other industries.

By GILL ROBB WILSON

This montage indicates the diverse field of achievements encompassed by Sperry inventions.

TRIUMPH in the art and science of human flight had progressed approximately two decades when it became irritatingly apparent that the airplane was still on short tether to the apron strings of mother earth. The plane could fly only so long as its pilot could see the attitude of its wings relative to the ground or the horizon toward which he cruised.

This barrier to utilization had not seemed important in the beginning. Concern with the fact of flight and concentration on design and materials had been all-absorbing. To improve aircraft performance and dependability was everything. Those who were caught briefly without visibility compensated for "blindness" by small ingenuities, such as listening to the changing tempo of wind in the wire, by observing a string hung from the windshield and by watching the wind-streamed angle of a silk stocking begged from one's best girl and tied to an outboard strut. Too, the stall did not develop so suddenly in the lightly wing-loaded planes and dangerous velocities did not build up too quickly.

Probably, we also developed a certain "seat-of-the-pants" sensitivity which served temporarily to see us through bits and pieces of "weather." I can recall lifting my face above the bit of windshield on the old open cockpits when climbing up through an overcast or letting down through cloud. The difference of wind pressure on one cheek or another would indicate a turning right or left or skidding or slipping in a maneuver. Open cockpits seem aboriginal today but we could not have survived without them. Additionally, aircraft of the VFR days could be set down in a myriad of tiny landing places not practical for cleaner ships of later times. Skill in forced landing situations was much of a pilot's stock in trade. Dead reckoning was basic in navigation but the "iron compass" and the "check point" were the mainstays of cross country.

Gradually, however, the science of aerodynamics got its "feet on the ground." Aircraft manufacturers began to turn out planes which were fully calculated mathematically. Few have ever realized that the original aircraft mainly were results of mechanical ingenuity rather than of algebraic logic, but such was the case.

With formation of aerodynamic laws, the biplane gave way to the monoplane. Drag was decreased in major proportions. Development of the air-cooled radial engine saved weight, produced added power and increased dependability. Under the influence of these and numerous other progressive developments the potential of the airplane as a decisive weapon and a medium of public transportation came into focus.

However, the great impediment remained. Flight still was restricted by visual reference to the ground and long range was captive to the inadequacies of the magnetic compass. So long as this condition persisted the air age would continue to be a flickering dream of frustrated airmen, unattractive to investment capital and almost meaningless to society.

Then it was that from native genius came the unleashing of flight to its greater destiny. The key to "blind" flight was cockpit instrumentation based on the gyroscopic principle and the man who conceived the key was Elmer Ambrose Sperry, inventor, engineer and scientist who had not only the creative imagination to grasp the principle but the mechanical genius to develop the essential servo mechanisms.

In original planning of this series of articles on the corporate evolution of American airpower, the writer had intended to deal only with the origins and progressions of the major airframe manufacturers. It seemed logical that the maturing of the powerplants, the flight instrumentation, the navigation systems and the airway aids and control facilities would fall into place in proper sequence with aircraft development. But as the corporate histories of Lockheed and Convair were processed —the two first subjects of the series—it became evident that our original premise was in error. To omit separate treatment of instrumentation and power would leave the entire work out of balance both philosophically and practically. Therefore, we decided to set chapters on instruments and engines square in the middle of the airframe story. And, as we have intimated in introductory remarks, the reader will doubtless soon conclude that there never would have been an aircraft industry had not the engine and instrument makers cleared away the road-blocks to expansion of aircraft utility.

Under the glass top of the desk of Bob Lea there used to lie a global map. Bob was the son-in-law of Elmer Sperry and a Sperry Corporation executive. One day after return from his New York to Paris hop, Charles Lindbergh dropped into Mr. Lea's office to thank him for Sperry's contribution to the success of his flight. "It could not have been done without the instruments," the pilot vouched and drew on the map the course he had flown to cross the Atlantic.

In successive months and years of that period others who emulated "Slim" in long-range adventure would come back to tell Lea the same thing and trace for him on the same map the various routes they had flown—Thor Solberg, Wiley Post, Dick Byrd, the "round-the-world" Army fliers, Jimmie Mattern, Bennie Griffin, Howard Hughes, Lincoln Ellsworth, Amelia Earhart, Roger Williams, et al. The old map with its tracings and signatures is about as good a testimonial as I can think of to the significance of instrumentation in the evolution of aviation. The various great libraries and aeronautical repositories should be vying with one another for eventual possession of this fragment of Americana.

ONCE having determined that my tapestry of corporate composition must treat of instruments as a distinctive phase, the trail could lead nowhere but to the doorstep of the present sprawling Sperry Rand Corporation and, as prelude, to the personality of Elmer Ambrose Sperry.

Here I came upon such a wealth of human interest that for a time I almost forgot my original mission. As a young airman I had known Mr. Sperry in the decade of the twenties and taken advantage of every opportunity to listen to him and exchange a word with him when opportunity offered. The urge to study great men in every walk of life had been planted deep in me by my father. Through him I had met as a boy such as William McKinley, Theodore Roosevelt, William Cody, Hall Young, Champ Clark, Andrew Carnegie, Boise Penrose and scores and scores of others . . . William Jennings Bryan, Warren Harding, Dwight Morrow, Thomas Edison.

The later opportunities provided by aviation were manifold. Through Bill Stout I met Henry Ford. Through Tooey Spaatz, Joseph Pulitzer. Through Hiram

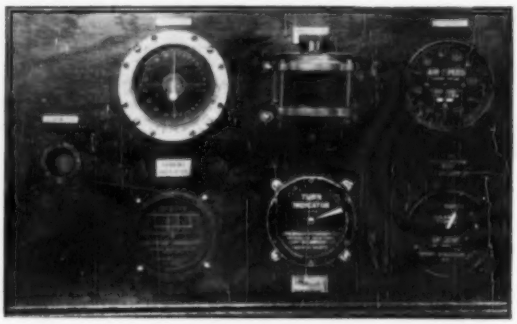
Bingham such as Robert La Follette, Hiram Johnson, William Borah and others in the political field. Of necessity I knew most of the figures in the military field—Army, Navy and Marine Corps. Then as a newspaperman, acquaintanceship was broadened—prize fighters, movie characters, bull fighters, statesmen, bums, rich, poor, black, white, brown and yellow, men from every creed and breed on earth. The study of them gave a zest to life and kept a young fellow humble in contemplation of the majesty of mankind.

In view of this experience I should have had a better evalution of the stature of Mr. Sperry and should not have been so amazed, as I have been, to discover the catholicity of his mind, the depth of his character, the usefulness of his life to his country, his times and to humanity. But if the true measure of the man had somewhat escaped me, the same must be true of the great mass of others in the field of aviation. It is a gap of knowledge which should be filled since Elmer Sperry's contributions to the founding of the air age are of its very essence. I propose to fill that gap enthusiastically, if inadequately, before detailing the story of the corporate structure of Sperry Rand.

Let me say bluntly as a beginning that in studied judgment Elmer Ambrose Sperry certainly must be rated one of the most useful men in American history.

In this peerage of usefulness his confreres are such as Benjamin Franklin, Robert Fulton, Eli Whitney, Luther Burbank, Thomas Edison, Henry Ford and the Wrights.

Fame, fortune, position, power, these attainments often are available to the mediocre. To stand among the magnificent useful in national perspective would appear to be the acid test of greatness.



Sperry airplane instruments coming into use at the end of WW I

For example, I doubt that more than a half dozen of our Presidents would make the grade in a roster of our 100 most useful citizens—probably George Washington, Thomas Jefferson, James Polk, Abraham Lincoln and Theodore Roosevelt.

Of these, James Polk, the least known, was without doubt the most useful political administrator. In similar vein, Mr. Sperry, one of the indisputable architects of modern times, is scarcely known beyond science circles.

Yet mark the mere highlights of his usefulness. As an inventor he was granted some 400 patents. Developments which he authored gave substance to many great corporations. He set up central lighting for metropolitan centers. He made possible the power tool mining of coal. He manufactured the first electric automobile. He developed the first heavy-duty battery. He engineered the most successful streetcar and outsold Westinghouse in its own home town of Pittsburgh. He developed the process of salvaging tin from scrap metal. He lifted aviation from the status of barnstorming to its role in transportation. He assured at a critical time the supremacy of United States seapower. He made a major break-through in railroad economy and safety. He exercised a unique influence in organization of international science. He was the father of the high-powered searchlight. Even as a boy he helped build one of the first dynamos in America.

Recognition of Mr. Sperry's catholicity of interest inevitably led me to comparison with others whose names have been mentioned in the roster of usefulness. As I studied their biographies, certain common denominators began to emerge, denominators which I never have found spelled out by publicists or historians.

For example, I observe that the primary genius of the notable useful lay in their recognition of a need rather than in any specific bent of their minds. To fill a need, sometimes intimately human and sometimes nationally significant but always pressing and practical, was the motivation of their efforts.

It was this consciousness and dedication that enabled the significantly useful ones to achieve notable inventions or originate far-sighted concepts, although they frequently lacked formal education or other background conducive to their achievements. It was this consciousness which kept their minds from running off into useless tangents—the occupational hazard of the pure scientist or of the theoretically highly educated.

For example, Benjamin Franklin was not above inventing a stove or bifocal glasses or the lightning rod or the rocking chair. These were things people needed. That they also needed a plan of union for the Colonies (which he was first to suggest), rural mail delivery, resistance to slavery, organized hospitals, circulating libraries, the backing of France to secure independence and other pertinent requirements which Franklin supplied, merely further illustrates his motivating philosophy.

Robert Fulton once said that his fertility of invention stemmed from recognition of need which he found around him. Actually, he was a great painter, so great that Benjamin Franklin foresaw him as one of the masters, yet he gave up his art to concentrate on serving his times. Piracy was the international menace of the sea in his day. He invented the submarine and the torpedo to free the seas. Lack of transportation cursed the colonies. Fulton invented the steamboat to utilize the rivers. But he saw many needs of lesser magnitude—a machine to quarry marble, another to spin flax, a third to make rope, a fourth to bore rifles, and so on.

Eli Whitney, exceptional among the most famed inventors as a college man, intended to be a lawyer but could never pass up the attraction of fixing anything he saw broken down or working ineffectively. Visiting in Georgia he saw why cotton was an unprofitable crop and set about to make it profitable. His notoriety today rests on his invention of the cotton gin. Actually, his fame should rest on the fact that he was the father of the production line—the concept which gave American industry its mighty stature. He never made a dime from the gin, although both it and (*Continued on page 85*)

The Colt, powered by a 108-hp Lycoming, cruises at 115 mph, retains many features of the Tri-Pacer.

This new two-seat sports-trainer makes its debut in three models: Standard, $4,995; Custom, $5,995; and the Super Custom, $6,995.

CHECK PILOT REPORT

PIPER COLT 108

By GERALD J. SCHLAEGER

PIPER'S NEW Colt 108 has a heritage which dates back to the "E-2" of the early "thirties." That the Colt strongly resembles the Tri-Pacer is no accident, as the design features and parts interchangeability played a large role in Piper's breaking the $5,000 price barrier with this sports-training airplane.

The Colt is the only high-wing plane offered by Piper in 1961; it may well be the very last of the famous Piper high-wing series.

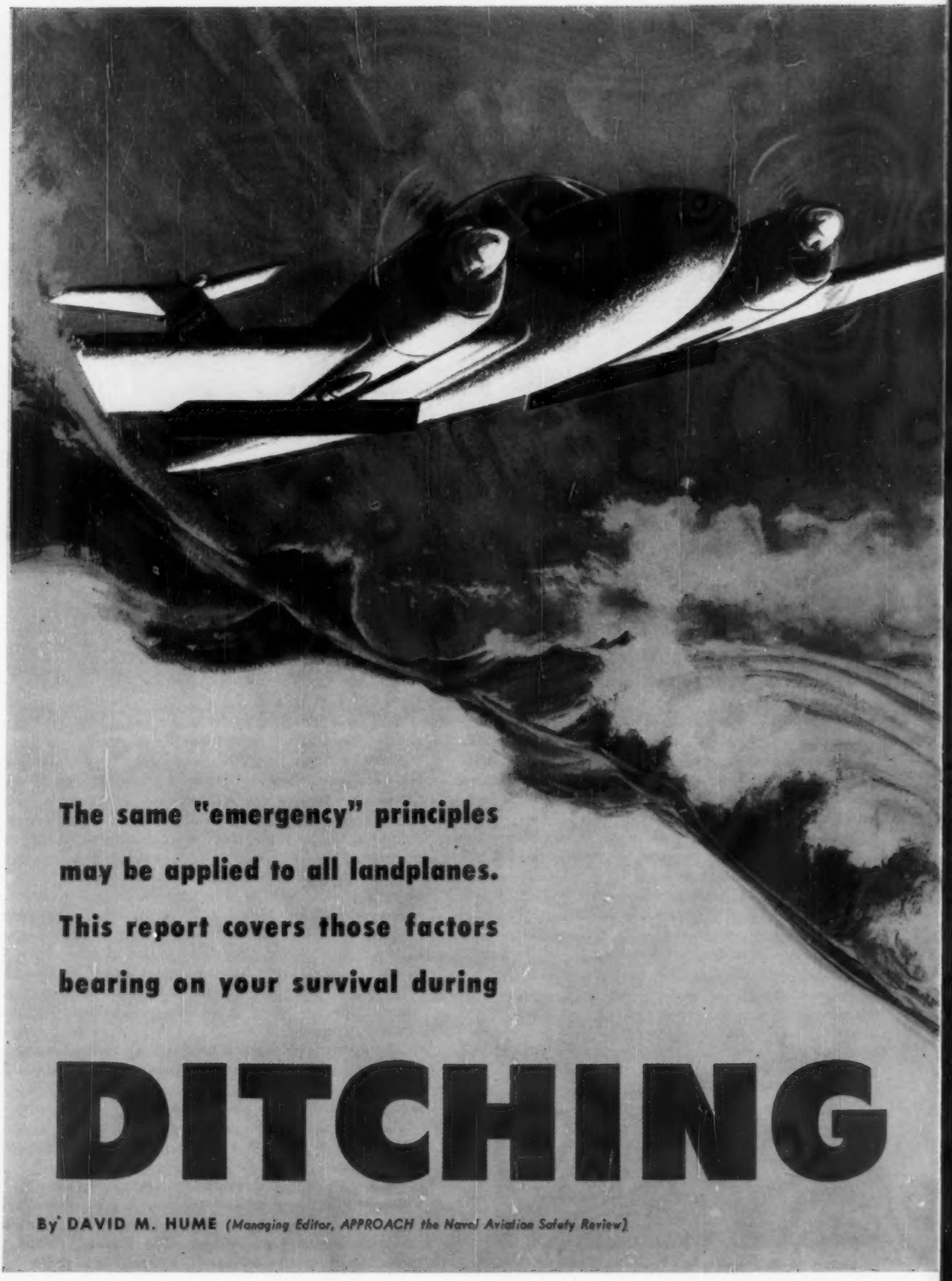
While the Colt's heritage dates to the E-2, it is a direct descendant of the popular Tri-Pacer. The rear door and windows were removed and covered over; the hump over the rear seat area was removed, making a sleeker silhouette. Basically it is a two-place Tri-Pacer with no flaps and a lighter, smaller engine.

The aircraft, N4502Z, used in the FLYING evaluation in the Bahamas.

The Colt made available for the FLYING evaluation, N4502Z, was a blue-and-white Custom Model; it was the number two production airplane. Entrance is made through the single door located on the right side by stepping on the main landing gear step provided; no gymnastics are required. Inside seating is quite comfortable. Seats are well upholstered and individually adjustable; leg room is adequate for even a six-footer. Sideward visibility is restricted by the high wing since eye level is just at the bottom of the wing. Flying must be done in a slightly stooped position if side vision is to be retained. It is strongly reminiscent of the old Monocoupe, and the full-sized skylight used by the Monocoupe would be a welcome addition. Forward visibility is good.

The instrument panel is the same as in the Tri-Pacer, with the number of instruments depending on the model purchased. Along the lower left side of the panel is a row of circuit breakers, but the battery switch is placed (or misplaced) under the front of the pilot's seat. Although it is similarly located in the Tri-Pacer, it still seems an odd place to hide it.

Brakes are actuated equally by a single lever centrally located under the instrument panel. A parking brake is provided. Steering on the ground is through the rudder pedal-connected nose wheel. The turning radius is quite small and close-in (*Continued on page* 82)



The same "emergency" principles may be applied to all landplanes. This report covers those factors bearing on your survival during

DITCHING

By DAVID M. HUME *(Managing Editor, APPROACH the Naval Aviation Safety Review)*

ANY PRIVATE or business pilot planning an overwater flight should be familiar with the techniques required in a *landplane* ditching, just as he understands emergency small-field procedures. Forced landings, and ditchings, do occur.

Most concerned with ditching are the navy pilots. The military pilot has a stronger aircraft, ejection system, survival equipment and better rescue facilities. But private pilots do have one advantage—lower impact speeds. Although their ditching problem is different, the principles are the same. The extensive military experience can be applied gainfully to the problem of how to ditch the typical private or business aircraft.

The effect of wing placement on ditching is the same for the Aeronca Champion as for the Chance Vought Crusader. Full-flaps are as important in ditching a Tri-Pacer as they are for a Connie. And banging nose first into an on-coming swell can be just as miserable in a Bonanza as in a Douglas Skyray.

It sounds silly to say, but you should ditch when it is the only thing you can do—when ditching presents the best chance for survival for yourself and passengers. Oddly, the need to ditch may not be recognized soon enough by the pilot or, if the need is recognized, it simply is not accepted.

A Navy report commented, ". . . the pilot never got the flaps down . . . did not jettison the drop tanks prior to hitting the water . . . did not have time to level his wings or establish a ditching attitude . . . it appears that the only possible error committed by the pilot was that of *not recognizing* or *accepting* the fact that he would have to ditch when trouble first developed."

According to *Aircraft Emergency Procedures Over Water*, prepared by the USCG, "A successful plane ditching is dependent on three primary factors. In order of importance they normally are: sea condition and wind, and type of aircraft." The first two are largely a matter of briefing, observation and thinking ahead of the airplane but any pilot can familiarize himself beforehand with the ditching characteristics of his aircraft.

A preliminary sea evaluation and selection of best ditching heading should be a part of every briefing for overwater flight. The pilot should re-evaluate the sea and refigure best heading throughout the flight and be able to whip around to a predetermined heading at the instant a ditching situation develops. He must beat down the natural impulse to head into the wind for landing. Landing into the wind usually amounts to landing almost perpendicular to the major swell system —which is like hitting a brick wall.

In all winds up to 25 knots the major swell system should be used to determine the landing heading. The easiest touchdown is made parallel to the major or primary swell and on a crest. This gives a choice of two possible headings—pick the one that comes closer to putting you into the wind.

Secondary swell systems—one or even two—may exist. The effect of these smaller swells is to obscure or fill the troughs of the major system and to complicate the problem of heading selection. The primary swell shows up most clearly at altitudes of 2,000 feet or more. It is necessary to get as low as 500 feet to evaluate any secondary systems.

When a minor swell appears to be of sufficient height to warrant consideration, the landing is made parallel to the major swell (as usual) and *down* the minor swell. Hit the major on a crest and the minor on the backside just beyond a crest. *It may be necessary to accept a tail-wind component to achieve this.* In any case, avoid the face of any swell.

When winds are above 35 knots, the aircraft generally should be pointed into the wind—a rough situation.

Winds of between 25 and 35 knots merit a second look, if possible, and generally require a heading which compromises between wind and swell effects. A heading of 45 degrees out of the wind and at 45 degrees to the main swell system is the usual resultant.

Whether ditching the biggest multi-fan or the hottest sports job, wind and sea conditions are the most important factors bearing on survival probability. Of course, the military pilot has no choice of the type aircraft he is forced to ditch with. The civil pilot does not choose his aircraft for its ditching characteristics, but this is no excuse for ignorance.

"By knowing the characteristics of the aircraft, and its expected behavior on the water, certain steps can be taken to insure best ditching performance," states *Aircraft Emergency Procedures Over Water*. "Data on ditching characteristics of most aircraft are available from controlled tests on scale models or from studies of actual ditchings."

Much testing of scale models was done by the hydrodynamics research division of the old NACA at the Langley Aeronautical Laboratory, Langley Field, Va. This division was closed in December of 1959 but not before they had completed numerous ditchings of dynamic aircraft models in one of their monster indoor tanks. (NACA Report 1347, 1958, Lloyd J. Fisher and Edward L. Hoffman.) The report discusses ditching characteristics of many types of airframes in general terms and gives specific test results for a number of models, including the Convair, (*Continued on page* 96)

This two-place light-weight rotorcraft, favorably combining performance and economy, is geared to the private operator who can do his own flying.

CHECK PILOT REPORT

BRANTLY'S B-2 HELICOPTER

By A. C. BASS

BRANTLY'S two-place B-2 helicopter, with stability and control features keyed to its unique main rotor design, is a fast light-weight rotorcraft capable of 100 mph at 78 per cent rated engine power.

The small, responsive helicopter—gross weight is 1,600 pounds—is the lowest priced utility helicopter available both for commercial and private use. Basic cost is $19,950.

The three-bladed, all-metal B-2, with its stressed-skin construction, is powered by a 180-hp Lycoming VO-360A1A engine. Vertically mounted directly below the main rotor, the powerplant supplies more than ample power for the loads imposed.

First flight of the B-2 was in 1953. After testing and additional modifications, the conical-shaped helicopter, mounted on oleo-skid landing gear, was delivered to the U. S. Army (five models) for evaluation. FAA certification was awarded in April, 1959.

To date 90 B-2s have been ordered; 55 have been delivered at this writing. Production at the Frederick, Okla. plant is at a one-plus-per-week rate. Brantly Helicopter Corp., with main offices in Philadelphia, states that a speed-up will jump the production rate to two a week, thus pushing up delivery dates.

FLYING's evaluation took place at Wings Field, Phila., in demonstrator provided by Kite Helicopter Corp., Brantly's northeast distributor. The wind this day was from the north-northwest at five mph. Outside air temperature was 74 degrees F. Field elevation at Wings is 300 feet. The 980-pound (dry weight) aircraft was fueled close to its 31-gallon capacity. With Kite salesman John Shapley aboard gross weight totaled near the 1,600-pound limit. The cabin itself is cylindrical with a spherical plexiglass nose canopy and two overhead plexiglass bubbles for additional head room. Getting into the cabin necessitates ducking under the low-set rotor blades. Fitted with new contour back cushions, the B-2 was relatively comfortable considering its compactness.

Flapping and lag hinges half way out on blades supplement pitch-change bearings, flapping hinges at the rotor head.

Engine and flight instruments are set into the center pedestal with a Narco Superhomer VHT-3 radio mounted beneath.

The starting sequence is activated by a button on the collective pitch lever—forward on the twist-grip throttle. A micro-switch protects the starter from being activated with too large a throttle opening and eliminates the possibility of engine overspeed. With the engine idling at 900 rpm a visual check was made to be sure the low-hinged blades were clear. The cyclic was centered and the rotor brake released.

At 1,500 rpm the centrifugal clutch engaged the rotor and the already warm B-2 was run up into its operating range at 2,850 rpm (2,700 to 2,900 rpm constitute its green-line limits). At this point the manifold pressure

The 1,600-pound, all-metal B-2 is capable of 100 mph at 78 per cent rated engine power. Powerplant is 180-hp Lycoming VO-360A1A.

Center pedestal includes instrumentation and a Narco Superhomer VHT-3 radio beneath it, starting switches, circuit breakers.

can be adjusted to 15-16 inches so that the throttle and collective synchronizer will maintain engine speed within its power-on limits, during almost every phase of power-on flight, as long as power increases and decreases are not abrupt. When properly adjusted the synchronizer will eliminate many of the fine throttle adjustments that power changes or gusty conditions will often necessitate in other rotorcraft.

After magneto and over-running clutch checks, and with all gages reading normal, we were ready for take-off. Using 23 inches mp and 2,900 rpm to break ground, power was advanced to 24.5 inches to gain forward speed for climb. Translational lift was gained at 10 mph and airspeed was increased to 55 mph for a time-to-climb check at best-climb speed.

Rate of climb for the B-2 is specified at 1,507 fpm. Using a watch to cross-reference the altimeter, climbout was accomplished at a slightly better rate than the specifications call for.

At 1,000 feet, cruise condition was established at 92 mph with the collective reduced to carry 21 inches mp. The control response of the B-2 is immediate. Stability about the lateral axis is excellent. There was a tendency for the demonstrator to tilt to the left on its longitudinal axis in cruise, but this was readily trimmed out by employing the nose-trim switch.

That the powerplant is operating is no secret. The noise level in the B-2 is rather high and can become bothersome after a time if head sets are not worn.

While maintaining our altitude the nose was lowered and power again advanced to commence a Vne (never exceed—maximum speed) run. With the B-2 red-lined at 100 mph there was no noticeable vibration increase through the controls or the fuselage, nor any change in controllability, as the needle brushed the limit speed. The impression left here was that Vne could be exceeded inadvertently but without fear of structural failure. Tests are under way to raise maximum speed.

For the power-on approach to the landing area, the collective was lowered to 11 inches mp and the airspeed reduced to 55 mph to set up a rate of descent. Initially, if too much power is carried, it is difficult to slow the airspeed with the result that the increased glide ratio will carry you beyond the intended point of touchdown.

Going through 75 feet a gentle flare is executed to slow the airspeed; this is further accentuated at 40 feet. (These manipulations of the cyclic at low altitude are facilitated by the rapid control response of the B-2.) Holding attitude level at 20 feet with an application of power, checks the rate of descent nicely and the oleo-mounted skid gear almost assures a comfortable landing.

This gear is a unique and extremely forgiving feature of the B-2. Four shock absorbers, each consisting of an oleo damper in series with a (*Continued on page* 84)

LEADING LADIES

Members of the fair sex continue to add to the long list of distaff achievements in aviation. Here is a chronicle of some of the highlights ranging from before the turn of the century to the present by the world's foremost aviatrixes.

By JAMES H. WINCHESTER

Jacqueline Cochran

WOMEN have written a long and brilliant chapter in aviation, almost from the very beginning of flight. The list of world and national flying records set by women from around the globe bears this out. Jacqueline Cochran, for example, holds five of 10 classifications listed under the international aeronautical records in the 1960 World Almanac, plus one U. S. record.

In the international light airplane record class women hold a number of honors. Jerrie Cobb, for example, until recently held a Class C-1.d (4,000-6,000 lbs.) mark for distance, holds closed-course speed, awaits confirmation of a 37,010-foot altitude record set in an Aero Commander.

Women today have advanced to where they are at home on virtually all levels of aviation. They make a valuable contribution as flight instructors and airport owners and operators. Others captain charter flights and non-scheduled airline craft—operate control towers, serve as airline dispatchers and aerial photographers—some are parachute riggers and jumpers, aeronautical engineers, airline hostesses, air show performers, flight nurses, ground school and simulator instructors, aviation writers and artists.

The picture is representative of today's women everywhere in aviation.

While the day may come when the first human will go rocketing off into space, that domain won't be exclusively a "man's world"—not if the girls have anything to say about it.

Trim, blonde Jerrie Cobb of Oklahoma City, who took her first airplane ride at the age of two and got her license at 16, is America's first woman candidate for astronaut. She passed the exacting tests demanded of the seven male airmen assigned to Project Mercury, the United States' project to put man into outer space. Twenty women volunteered to take these tests. Twelve eventually were processed through a battery of 87 physiological and psychological tests. Miss Cobb, who is advertising and sales promotion manager of Aero Commander, Inc., led the applicants in successfully passing this examination. She passed with flying colors.

Amelia Earhart

Jerrie, who was named the 1960 Woman of the Year by the Women's National Aeronautic Assn., largely because of her many record-breaking altitude, distance and speed flights in light and medium-size aircraft, has logged more than 7,500 flying hours, many in jets. Now only 29, she's dusted crops, taught flying, and is the fourth American (male or female) to

receive a gold medal from the Federation Aeronautique Internationale.

As well known today as Amelia Earhart was in the '30s, is another woman pilot, Jacqueline Cochran (Mrs. Floyd Odlum). Jacqueline was the first woman to pilot a jet airplane faster than the speed of sound (Ann Baumgartner Carl of Long Island was the first woman to pilot a jet—the Bell YP-59 in 1944). Jacqueline has established more officially recognized national and international records than any other woman pilot in history. She won the Bendix transcontinental speed race against the nation's top men pilots and three times has received the Harmon International Trophy. She is also a three-time recipient of the Harmon National Trophy for women.

But it was as World War II commander of the 1,000-strong WASPS (Women's Air Service Pilots) that she is perhaps best remembered. At the request of the late General of the Air Force "Hap" Arnold, she recruited and escorted to England a group of 25 American women pilots for ferrying service with the British Transport Auxiliary. Meanwhile, in the United States, the Women's Auxiliary Ferrying Squadron, made up of another group of experienced pilots, began operation out of Wilmington, Del., headed by Nancy Love, with Betty Huyler Gillies as deputy.

Ruth Nichols

In 1942, Gen. Arnold called Miss Cochran back from England to recruit and train under the Air Force Training Command a group of women pilots to take on military non-combat flying jobs within the United States. More than 25,000 women applied. Of these 1,800 were accepted. From the 1,800 trainees, all of whom were required to hold a private pilot's certificate to qualify, more than 1,000 graduated.

Their safety record was noteworthy—.02 less than that of the overall fatality rate in the USAF. Thirty-nine women lost their lives—a rate of one fatality for each 16,000 hours of flying.

Jackie received the Distinguished Service Medal for her leadership in the WASP Program.

Well over 12,000 women hold valid U. S. pilot licenses today, but the recording and literature of America's, indeed the world's, pioneer women aviators, sad to say, are grossly inadequate.

Almost lost are the colorful stories of such pre-World War I American women pilots as Miss Quimby and Miss Moisant; Ohio's Bernetta Miller, who qualified for the fifth U. S. female flying license by making her qualification flight at night; Denise Moore, the first American woman to lose her life in a plane, in 1911; Julie Clark, U. S. woman pilot number three; Katherine Stinson, woman license holder number four; Ruth Bancroft, better known later under her married name of Ruth Law; and many others.

Take Harriet Quimby, for example. Only two days after getting her license, she thrilled 20,000 people on Staten Island with a moonlight flight, and a month later set a women's altitude record of 1,500 feet. After completing a hedge-hopping cross-country trip in November

Blanche Noyes

of 1911, she became the first woman to fly over Mexico City. In the spring of 1912, only eight months after soloing, without having used a compass before and flying a new-type plane for the first time, the dauntless woman pilot crossed the English Channel from England to France. She was the first of her sex to accomplish this feat.

Harriet Quimby, who gave up flying after her plane fell into Boston harbor during a 1912 meet, usually is listed as the first woman pilot in the United States. She began flying at Garden City, L. I. in 1911 and was the first American woman to receive recognition from the Aero Club, which then assigned all U. S. pilot's licenses. She got her ticket on August 2, 1911, beating out Mathilde Moisant by 15 days.

Both Quimby and Moisant, however, followed behind Blanche Stuart Scott, who on September 2, 1910, soloed a Curtiss biplane at Hammondsport, N. Y., and went on to a career in aviation that spanned three decades; and Wisconsin-born Dr. Bessica Faith Roche, a graduate of Tufts Medical School who on September 16, 1910 at Mineola, L. I. flew a biplane constructed by her husband. These women didn't apply for or get licenses until much later.

Katherine Stinson

Katherine Stinson, a 19-year-old Alabama girl, was the fourth U. S. woman to win a pilot's license, the first to "loop-the-loop," to sky-write, and to fly in the Orient. Flying a Curtiss "Jenny," she raced the New York Central's famed Empire State Express from Buffalo to Albany, and beat it by 34 minutes. She was also the first woman to carry the air mail. On December 11, 1917, she flew 610 miles between San Diego and San Francisco for the longest nonstop flight by either man or woman up to that time in America. Later she bettered this mark with a 783-mile, 10-hour nonstop flight from Chicago to Binghampton, N. Y.

At the start of World War I, before America entered the conflict, Katherine, her brother Eddie, and her sister Marjorie, pilots all, along with another brother, set up a flying school at San Antonio, Tex. They turned out hundreds of pilots who later joined the U. S. and Canadian forces. Marjorie Stinson, incidentally, won her own license in 1914 at the age of 18—the youngest woman up to that time to earn one in the United States.

Jerrie Cobb

Katherine did her best to get into World War I as a combat pilot, but the military brass didn't go along. She finally went overseas as an ambulance driver. Taken ill in France, she spent a year in the hospital and never (*Continued on page* 87)

Executive helicopter pilot

Vinton A. Smith and United Aircraft's busy S-51 logged many hours together in 14 years.

Smith sets the altimeter preparatory to takeoff in the Sikorsky S-51.

By FRANK J. DELEAR

OVER THE YEARS, Vinton A. Smith, a soft-spoken, almost retiring man, has preferred to let his proficiency as an aviator speak for him. He could have had no better spokesman. Today, a slim and active 48, Smitty is the unchallenged dean of executive helicopter pilots, his wiry figure and easy smile as well known as the old-yet-new helicopter in which for almost 14 years he has hopped about the countryside of his native Connecticut.

"People sometimes tell me I have the best job at United Aircraft," he said the other day. "This, of course, is an exaggeration. However, I have to admit that I wouldn't trade jobs with anyone. Flying a helicopter all these years has been a most interesting and enjoyable experience."

Smith, a native of Plainville, Conn., is a member of United Aircraft's executive flight group which includes eight other pilots. They operate a Convair 340, a Douglas DC-3, a Lockheed Lodestar and the helicopter—a Sikorsky S-51. The 'copter, a four-place job powered by a 450-hp P&W Wasp Jr. engine, was delivered in January, 1947. It has a gross weight of 5,500 pounds, a range of 250 miles, a cruising speed of 85 and a top speed of 103 mph.

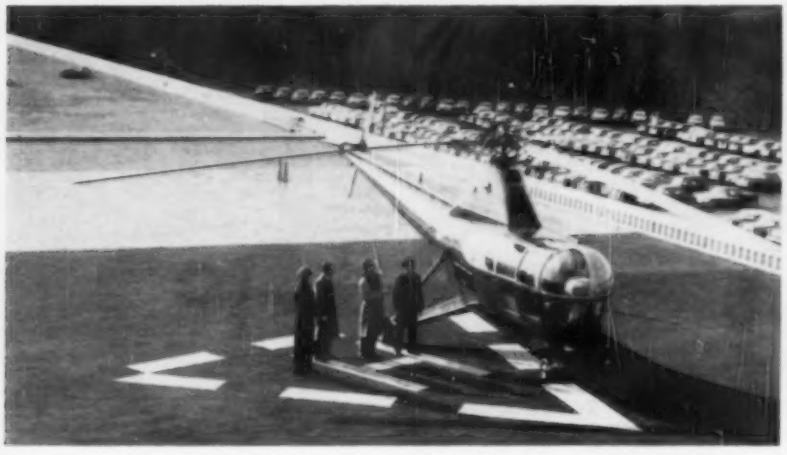
Smitty's aviation career dates back to 1933 and Parks Air College, East St. Louis, Ill., where he learned to fly. He owned an OX-5-powered Curtiss Robin in the mid-1930s, ran a flying service in Bristol, Conn. for three years, did a hitch as a flight mechanic at Pratt & Whitney Aircraft's hangar in East Hartford, and has been a company pilot for United Aircraft since 1937.

In 1946 he was checked out in an R-4, Sikorsky's first production helicopter, and in an S-51. When United received its S-51 in January 1947, Smitty was ready for the rotary-wing duty which has continued to the present.

United Aircraft's plants in Connecticut are spread over an area roughly 75 miles in diameter. The S-51 has proved a time-saving means of linking corporate headquarters and its Pratt & Whitney Aircraft plant in East Hartford with other P&W plants at Southington, 15 air miles away, and North Haven, 25 miles south; Hamilton Standard at Windsor Locks and Broad Brook, 15 miles north; a nuclear engine laboratory at Middletown, 25 miles southeast; the Sikorsky plants at Stratford and Bridgeport, 50 miles southwest; and the Norden division at Stamford, 60 miles southwest.

Frequent flights are made to New York—to Idlewild and LaGuardia airports and to a heliport at 30th Street on the Hudson River—about 100 miles from East Hart-

The S-51 approaches the helipad on lawn of United's headquarters at East Hartford.



Left: At P&W's North Haven plant, the S-51 lands on the roof. *Right:* Climbing for a landing on 6,200-foot Mount Washington, in background.

ford. "We fly these trips in an hour and 10 minutes," Smith says, "which saves an hour and a half over parkway driving and is substantially faster than by scheduled airline, considering the taxicab or automobile ride to the airport."

The helicopter flies from the front lawns of most of the plants, only a few steps from offices and conference rooms. At North Haven, it lands on the plant roof. Recently, curious about what a helicopter as a business aircraft can accomplish, Smith checked his logbooks to find out how much travel time the helicopter has actually saved over the years.

"As nearly as I can figure it, averaging two passengers per trip," he says, "we have saved a total of about 12,000 hours of travel for our people compared with the time that would have been required if they had used surface transportation. This is equivalent to six years of normal working time for a busy executive. How much this means in money saved, I cannot begin to guess, but it must be considerable in view of what an executive's time is worth.

"With the helicopter our attitude toward poor weather is different from that of a fixed-wing pilot," Smitty says. "We know that we can always slow down and even stop in flight, if necessary, to look a situation over. We need 800 feet to clear some of the hills along our usual routes, but if they are socked in we have other low-level routes we can follow. We can fly safely lower and slower than fixed-wing aircraft and so can alter our course according to conditions and even land if necessary. Beaches have proved to be good places for such landings."

Once Smitty flew two Navy submarine captains from a beach in New London to the Hamilton Standard plant in Windsor Locks for a Savings Bond program. The weather turned sour with heavy rain and low ceilings, so he followed the Connecticut River all the way to the plant, hedge-hopping bridges and, for safety's sake, staying well below a 300-foot power line. "When we landed," Smitty recalls, "one of the officers said that for a while he thought he was back in his submarine."

The helicopter receives many special assignments. It is flown for aerial photography by many departments. It is used for survey work; the future building site for one of the United's largest plants, the Sikorsky facility in Stratford, was selected from the helicopter. The helicopter is used for various promotional projects, to help out in charity and other community drives, and generally, to help any project for the common good. The result is good will for the company.

The S-51 is available for (*Continued on page* 90)

The WORLD'S MOST NORTHERN AIRLINE

Flying over mountainous coastline, Wideroe's Otters annually transport over 20,000 passengers in scheduled operations beyond the Arctic Circle.

By CAL FLOYD

Above: Loading a patient aboard Noorduyn Norseman. Ambulance service is never suspended, but regular routes are limited to day, March to mid-November.

IN AN AGE when push-button flying and jets have taken over commercial routes there still remain some airlines using single-engined planes, flown mostly under the clouds by pilots who regard flying as a personal art. One of the most unique is Wideroe's Flyveselskap a/s, the world's northernmost scheduled airline, operating between the latitudes of 69° and 71° entirely above the Arctic Circle around the top of Norway, at a latitude corresponding to that of Point Barrow, Alaska.

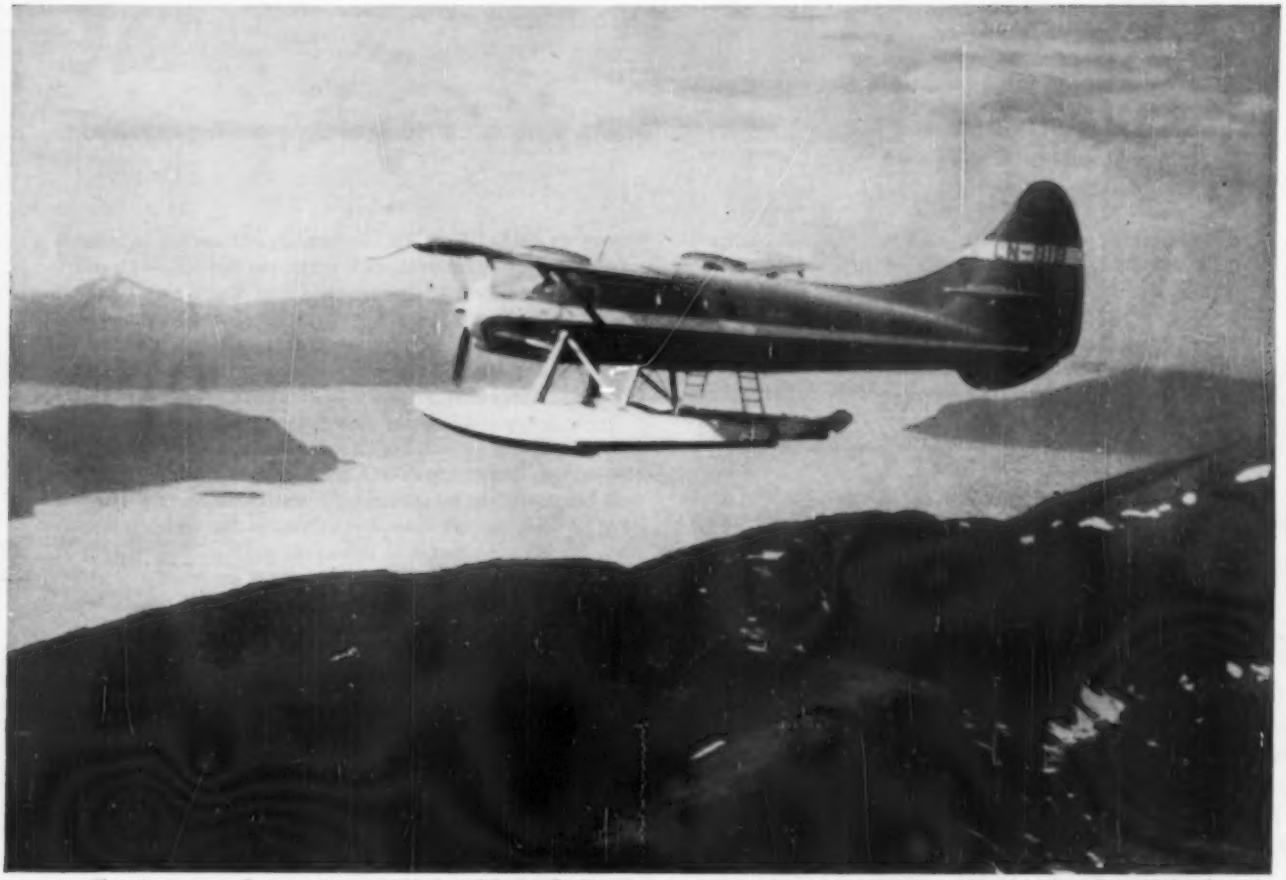
Tourists see north Norway as an incomparable area of rugged peaks, majestic fjords and countless coastal islands, but to aviation pioneers who first planned an air service there some 25 years ago it presented only formidable problems. They faced an attenuated mountainous coastline of some 1,000 miles stretching far above the Arctic Circle, dotted with a myriad of lakes—but with almost no level ground suitable for airfields, and heavy cloud conditions constantly threatening sudden violent storms characteristic of the far north.

Even so, the establishment of a regular northern air link was made vitally necessary by the geographical barriers to surface transportation between the isolated Arctic communities, the difficulties in transferring seriously ill people to doctors and hospitals and to exploit the area's tremendous potential for tourism. Serious financial limitations and the German occupation of Norway during World War II long delayed the development of

Passengers are on- or off-loaded by means of floats or launches.

flying. Until 1954 air services in north Norway were sporadically operated by three separate companies. In that year, however, a landmark in Norwegian civil aviation was reached when Wideroe's agreed to operate all north-Norway routes in co-operation with the Scandinavian Airlines System.

Wideroe's, Norway's oldest aviation concern, had been engaged since 1934 in charter flying, aerial mapping and ambulance flights throughout the Arctic and Antarctic



The 12-passenger Otters navigate mainly by ADF, slow-fly 80 mph during marginal weather. Visibility minimum is about five-eighths of a mile.

A routine call by a Bell 47J. The mountains tower on all sides.

and had acquired just the type of experience needed to undertake the difficult task of operating an airline above the Arctic Circle in an area of staggering natural barriers. Since accepting the challenge in 1954 Wideroe's has progressively improved its service and succeeded in furnishing north Norway with a truly efficient air network. The number of passengers carried has been increasing at the rate of 30 to 40 per cent each year and, during 1959, the airline transported some 20,000 passengers, approximately 60,000 pounds of cargo and nearly 300,000 pounds of mail.

The institution of regular air routes in this once remote region has had a revolutionary effect on the way of life where surface and water transportation is slow and costly due to the rugged interior and fractured coastline. A journey that once consumed 17 or 18 hours by coastal steamer or bus now takes only one hour by air.

From the first, Wideroe's routes have been flown by four, single-engined, 12-seater, de Havilland Otter seaplanes. This sturdy aircraft, first flight tested in 1954, was a natural choice for north Norway as it was developed especially for Canadian Arctic flying as a utility and search and rescue craft—rugged seaplanes which could make good use of the numerous lakes and protected coastal harbors during the warm months, and convert to skis during winter. Furthermore, the Otter is capable of a full-load takeoff within 655 feet, at from 3,000 to 4,000 feet above sea level (no wind), a necessary qualification in mountainous terrain. Both the U.S. Army and Navy employ the Otter as a light cargo carrier and search and rescue craft, usually in polar areas.

The northeastern anchor of Wideroe's airline is Vadso, close to the Russian border. From northeast to southwest the route then passes through Kirkenes, center of Norway's largest iron mines, on to Hammerfest, the world's northernmost city and then to Alta. Alta is the gateway to Finnmark, home (*Continued on page* 89)

THE PRO'S NEST

A PRIMER FOR

RADIO NAVIGATION

Two actual flights taken from the author's log book show how to apply step-by-step procedures.

By TED DUROSKO

Pilots who look forward to an instrument

TO QUALIFY for an instrument rating, a pilot must demonstrate two major proficiencies. One is the control of the attitude and flight path of the aircraft by reference to flight instruments; the other is to fly the aircraft precisely from one point to another via a designated route by use of radio-navigation aids.

Such accomplishments may seem a large order to a private pilot who lives for the day when he will have all the necessary instruments in his airplane, or when funds will be available to attend an instrument school. However, if his aircraft is equipped with the usual instruments and radio found in the average four- to five-year-old, four-place airplane with a modest amount of radio gear, he can organize his own program to start practicing the second phase of instrument flying and can be that much ahead when he finally enrolls for a formal course.

What radio equipment is necessary for a primer program? Ultimately, the pilot will require an omni receiver with a separate "to-from" indicator (and ability to track on localizer signals), a glide-slope receiver, a marker-beacon receiver, and a low-frequency ADF (automatic direction finder) or radio compass as it is sometimes known. In addition, he will require a multi-channel VHF transceiver for communication purposes. If such equipment is in the airplane, the pilot will derive full benefit from a primer program. If only a portion is available, then the benefits are somewhat reduced but, nevertheless, there are advantages still to be gained.

The minimum equipment for a primer program should include a Superhomer (or equivalent) with a low-frequency flat-pack receiver, or a separate low-

Fig. 1

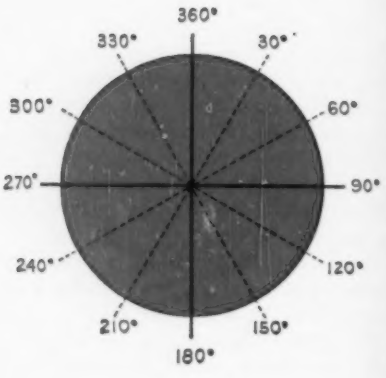


Fig. 2

FLIGHT LOG

STATION OR INTERSECTION	CLEVE. HOPKINS	CLEVE. OMNI	INTERSEC. "A"	AKRON	INTERSEC. "B"	MILLERS AIRPORT	
DISTANCE		16	21	22	22	6	
BLOCK TIME	/	10 / 12	12 / 14	15 / 13	13 / 13	8 / 8	
ESTIMATE		25	39	56	07	10	
OVER (ON-OFF)	OFF 1015	27	41	54	07	10	
ALTITUDE		3500	3500	3500	3500	3500	
GROUND SPEED	EST. 96	80	90	101	101	120	

(SPACE FOR RECORDING WEATHER SEQUENCES, WINDS ALOFT, FREQUENCIES, CLEARANCES, FIGURING HEADINGS, ETC.)

rating can set up a study program in any ship having average radio-navigation gear.

frequency receiver similar to the G.E., Hallicrafters or Harvey Wells. In addition to the basic panel instruments, there should be a directional gyro. If not available, a magnetic compass can be used, but it is more difficult to work with as it bobs in rough air, and over- and under-rotates during turns.

The reason a directional gyro is recommended is because, in radio navigation as in dead reckoning, close holding of headings is essential. When flying on an omni radial, for example, the pilot should not think in terms of just "flying the needle" by turning the airplane to the left or right to get it centered. He should think in terms of magnetic headings, and what heading he must fly the airplane to have it track on the selected radial to center the needle.

Likewise, when flying a leg of the low-frequency beam, the pilot should establish a heading which will keep him on the right feathered-edge of the beam. This is the position where the on-course signal is heard with a slight undertone of the A- or N-quadrant signal. By knowing the heading necessary to "lock on" to the beam the pilot can continue on his designated course should the beam transmitter fail, or the signal become weak, as he flies out of range; he also can make a precise 180-deg. turn to reverse his direction of travel on the beam should unexpected weather be encountered.

If you are planning to set up a primer program for yourself and are not "compass-rose minded," stop here and do a few memory exercises on Fig. 1. By memorizing or visualizing the compass-rose and its main points (30-60-90 deg., etc.) it then becomes rather easy to keep oriented mentally in flight, and also quickly determine the reciprocals. Another prerequisite for the radio navigation primer program is familiarization with the computer for figuring time-distance relationships.

When making practice flights, this information should be entered in a flight log, along with distances between radio aids or intersections, time over such points, ground speed, estimated time over the next check point, and any other information the pilot may need. The form used can be similar to the one in Fig. 2, suggested by Bonanza pilot Vic Ball.

One point of caution: remember that this program is to be conducted under VFR conditions, which means that you must maintain a careful watch for other air traffic. Do not form the habit of getting engrossed in tuning radios or doing paper work at the expense of vigilance. If tuning of radios and paper work in the cockpit are strange to you, take along another pilot to act as a lookout.

To get started on a practice flight, plan a 50- to 100-mile trip between two airports and lay out the course to utilize radio navigation all the way. For examples, let's take two of the practice flights that I set up on my primer program. I was flying a Stinson Voyager equipped with a Superhomer and a low-frequency receiver; on the panel was a directional gyro, in addition to the other instruments. Cruise was 110 mph.

I decided to fly to North Benton, O., and visit Russ Miller, who operates Miller's Airport. My course was laid out on the Cleveland sectional, as in Fig. 3. The course utilized the Cleveland omni, the Akron (Ohio) low-frequency range, and the Youngstown omni.

That morning the wind was (*Continued on page* 93)

Fig. 3

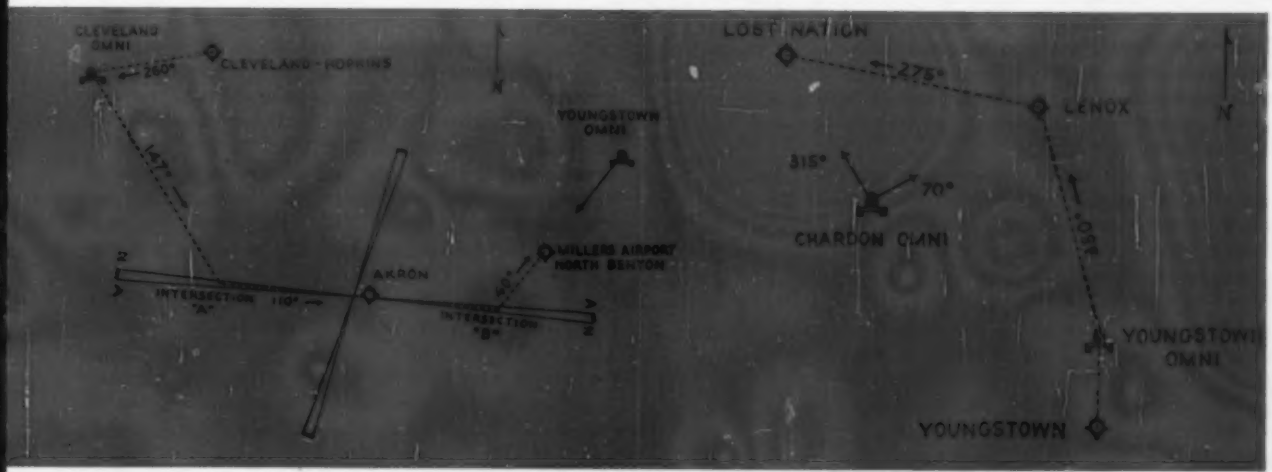


Fig. 4

Intelligent preparation is the key to survival when forced down at sea or in uninhabited country

A GUIDE TO PILOT SURVIVAL IN THE OPEN

By JOHN T. FLYNN, M.D.

CAREFUL PREFLIGHT planning often must include thorough knowledge and adequate equipment for rescue procedures and for survival in the open. A stretch of uninhabited jungle, mountains, desert, arctic region, or open sea which can be crossed in several hours by air may require weeks or months of great physical effort and skill to cross by foot or by small water craft in the event of a forced landing or ditching.

In anticipation of such emergencies, the aircraft should be equipped with survival kits appropriate to the region. These might include signaling equipment, first-aid kits, extra clothing, emergency rations, snares, fishing equipment, and small caliber weapons, to mention a few. Life vests fitted to the individual and equipped with a properly functioning inflation mechanism may be needed. Clothing and shoes appropriate to ground survival in the area should be worn in flight.

If faced with an emergency landing, don't bail out if at all possible; stay with the aircraft for a crash landing or ditching. After ditching in open water, survivors must quickly leave the aircraft. If necessary to drop into gasoline-covered water, protect nose and mouth tightly with the hands. Swim as far as possible under water into the wind if the gasoline is aflame. After a forced landing in jungle, mountain, desert, or snow-bound areas, remain with the aircraft. It can be a source of fuel, shelter, and a visible marker for rescue efforts.

Following the landing or ditching, first-aid must be administered to passengers and crew who have been injured; compression bandages rather than tourniquets should be used in cold climates where frostbite is a danger. Thereafter, survival procedures must be organized, with immediate attention to shelter, water, food, continued medical treatment and preventive measures. Also, measures should be taken to aid rapid location by rescue parties.

Adequate shelter for quick, effective protection against a hostile environment is an immediate necessity. In cold climates, at sea, and at night in the desert, the body will lose heat rapidly by radiation under open skies, especially cloudless ones. Steady wind causes more heat loss, even though the temperature of the air may not be unusually cold. With very cold wind or snowstorms, seek shelter in caves, the lee of rock formations, in holes or trenches dug in snowdrifts, in igloos cut from wind-packed snow. Tents should be double-layered; sleeping bags should be double-quilted. Clothing should never be tight. Shelter should have flooring if possible—boughs from trees or bushes, tarp, extra clothing, parachute. Keep clothing and equipment dry. Snow above and around a shelter will improve insulation against the cold. Adequate ventilation in shelters is important to prevent carbon monoxide poisoning from cooking stoves or heating units. Freezing to death during sleep is unlikely unless you are completely exhausted; when you become too chilled, you will awaken. Steady movement will restore body heat, again permitting sleep. The metal surface of an aircraft radiates heat so rapidly that it may provide inadequate shelter in cold climates or at night in the desert.

Shelter in the desert may be sought beneath parts of the aircraft, caves, the undercut banks of dry river beds. In most deserts, during the day, at a depth of 30 inches the ground temperature is below 70 degrees F. Again, the metal skin of the aircraft absorbs heat during the day, so that the interior is too hot for suitable shelter, in many instances.

In the open sea, life rafts should always have wind breakers, spray shields, or other exposure coverings whenever possible.

Water is the single most important physical necessity for survival in the open; the body needs at least a quart per day. Water from below ground is generally pure. Running water tends to purify itself, though stagnant water in swamps, bogs, and in pockets on the forest floor can be pure if distant from human habitation. Rock-springs and rainwater are safe. Fresh water will rise in holes scooped out in seashore beaches at low tide, in low forested areas along the seashore, and in the flood plains of large rivers. Brackish water can be improved by running through a sand filter, boiling where possible, and shaken to reaerate. In the desert, water is most often located at the convergence of game trails, and near grasses, rushes, bushes, palms, or brightly green vegetation; also in the direction of flights of birds, especially pigeons and parrots. Liquids from plants and sap are chiefly water; *never* drink milky-looking fluids from desert plants or vines, because of the presence of poisonous alkaloids. Considerable water is present in the growing tips of plants, leaves, stems, buds, roots, nuts, and fruits. (*Continued on page* 80)

Only two miles from Amarillo, the airport has two paved runways. One is 4,000 ft. and lighted; the other is 1,800 ft. paved, 1,200 ft. grass.

AMARILLO'S TRADEWIND AIRPORT

A formula for growth, Texas style: good employee relations and first-rate service.

By DON DOWNIE

AMARILLO, TEXAS, has two paved airports. One is the huge 13,500-foot runway AFB/municipal and Strategic Air Command base at English Field, some 12 miles east of town. The other is a small—for Texas—640-acre field known as the Tradewind Airport.

Today at least 90 per cent of all transient traffic landing at Amarillo touches down at Tradewind, despite the fact that the FAA weather station and communications center is on English Field. However, a direct line inter-com in the Tradewind lounge brings this service to the customer's fingertips.

Formation of the Tradewind Airport goes back to the waning days of World War II. Shelby M. Kritser, president of the Tradewind Corp., was then a Pan American Airways flight engineer. He is now general manager of the Amarillo Globe-News. The day he returned to Texas from Boston, he began to promote the airport. There are 20 stockholders, all Amarillo and Texas Panhandle ranchers and businessmen with an interest in flying. None of these stockholders has shown any profit on his investment; it's all been put back into improving the field, but the airport itself has shown a profit for the past four years. Gross sales for 1959 were $1,500,000.

The first full-time employee at Tradewind was an ex-Brooks Field flight instructor named Bob Siler. He's still there as manager with 32 people on the payroll. The corporation owns four large hangars. It is Beechcraft distributor for 48 counties in Texas and three in Oklahoma, and operates an approved airframe, engine and radio shop. It leases space to a flying school, the FAA district safety office, a Cessna dealer and two agricultural operators.

The corporation has erected 30 T-hangars. "Plush" hangar rental, which pays for moving the plane out of the hangar, help with luggage, having a car available and handling all servicing following flights, is $50 per month. Where the owner does his own work, T-hangar rental is $25 per month plus an additional $5 if the hangar has a cement floor. Outside tie-down is $15 per month or $1 per night, (*Continued on page* 94)

The Tradewind Corp. is Beechcraft distributor for 51 counties in Texas and Oklahoma. In addition to four large hangars, there are 30 T-hangars.

NEWSREEL

SHADES OF WORLD WAR I *(Right)*. A Spad S.13 of 1918 vintage, one of a number of antique airplanes authentically restored by Cole Palen of Rhinebeck, N. Y., is piloted by owner over upstate New York. The Spad, which was a widely used fighter by both the French and U.S. air forces, is powered by a 200-hp Hispano-Suiza V-8 water-cooled engine, has a top speed of 130 mph at 6,500 feet. The airplane is not difficult to fly but is prone to ground looping due to its forward-placed landing gear and heavy weight on tail skid.

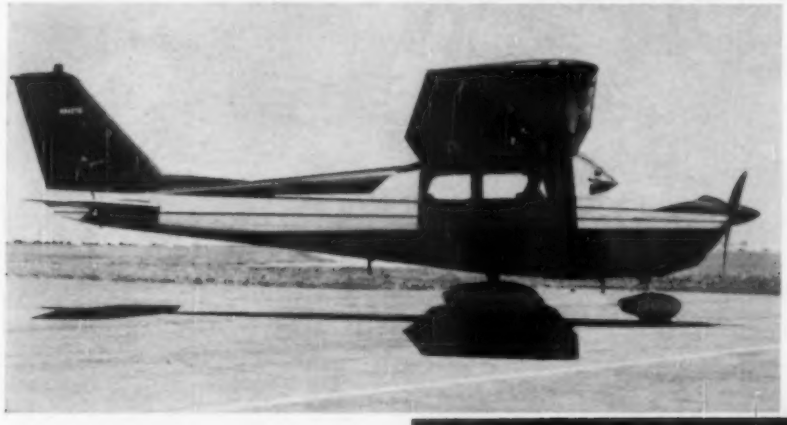
AEROBATIC SPECIAL *(Left)*. Designed primarily for stunt flying, this swept-wing biplane is jointly owned by Rodney Jocelyn, former U.S. aerobatic champion, and Lindsey Parson, both of whom built the aircraft. Powered by a 260-hp Lycoming engine, the J-P Special has a maximum speed of 175 mph at 7,500 feet. Wingspan is 26 feet 10 inches, gross weight 1,900 pounds. Jocelyn is planning to fly the airplane at the World Aerobatic Championships due to be held in Spain sometime this year.

NEW LIGHT TWIN *(Right)*. Meteor II, developed and manufactured by Saturn Aircraft & Engineering Co., Oxnard, Calif. Powered by two Lycoming engines of 180 hp each, the four-place airplane has a cruising speed of 200 mph at 75 per cent power and a gross weight of 3,800 pounds. Total fuel capacity is 120 gallons, 80 of which are in the fiberglass tip tanks. Chief engineer of Saturn is C. G. Taylor who was responsible for the Taylorcraft design.

CANADIAN BUSH PLANE *(Left)*. Four-place utility aircraft, designed and built by Found Brothers Aviation Ltd., Malton, Ont., for commercial operations in undeveloped areas. The FBA-2A can be easily converted for freight carrying duties by removing the rear seats. Four large doors allow unrestricted access for cargo loading. Engine is a 250-hp Lycoming.

NEWSREEL

CESSNA 185 *(Right)*. One of the new additions to the 1961 Cessna line, the Skywagon carries six and can be quickly converted for agricultural or cargo work with the interior seating arrangement varying from one to six depending on duty requirements. The aircraft is powered by a 260-hp Continental IO-470-F fuel-injection engine and is certificated for conventional, float or ski landing gears. Top speed is 176 mph; maximum range with standard fuel capacity of 61 gallons is 770 miles.



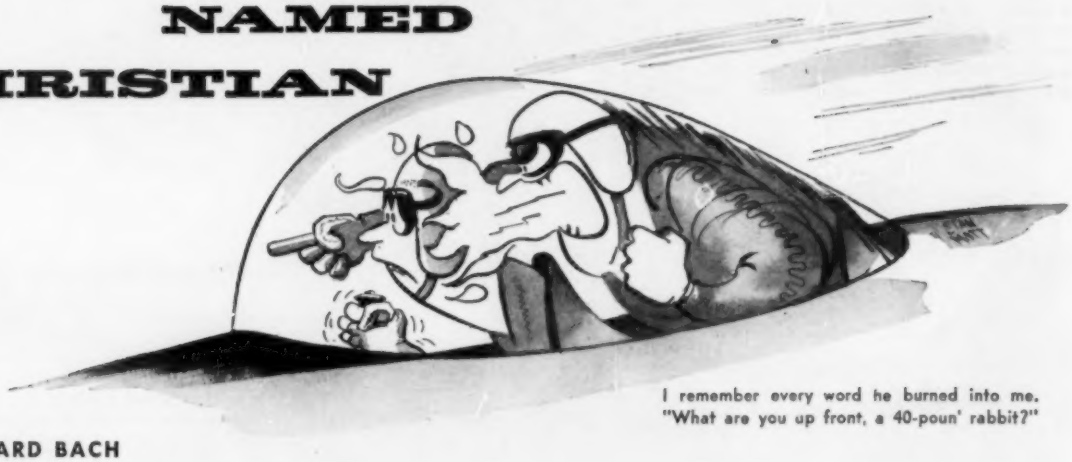
CESSNA SKYHAWK *(Left)*. A deluxe version of the popular Model 172, the new aircraft features factory-installed optional equipment which has been optional on the 17a. The configuration of the two airplanes is identical with the exception that the Skyhawk has wheel fairings. Top speed is 140 mph. The 172 has a new fuselage with an external baggage door. The landing gear has been lowered three inches and the engine raised to provide propeller clearance. Engine is the 140-hp Continental.

PIPER CHEROKEE *(Right)*. New, low-wing, four-passenger business plane, recently introduced by Piper Aircraft Corp. Of all-metal construction, it is powered by a 160-hp Lycoming engine and has a cruising speed in excess of 130 mph. Gross weight is 2,200 pounds, weight empty, 1,185 pounds. Standard fuel capacity 36 gallons, optional, 50 gallons.

GRUMMAN HAWKEYE *(Left)*. A highly specialized early-warning aircraft, the W2F-1 is equipped with special electronic radar/computer system called ATDS (airborne tactical data system) capable of evaluating and directing an attack in the minimum of time required for interception and to relay the information to surface units. Umbrella-like radome encloses an antenna which simultaneously can gather height, azimuth and distance data. The Hawkeye is powered by two Allison T56-A8 turboprops of 4,050 eshp each.

He was a fire-breathing instructor of the old school but there should be more like him says this ex-student.

A LIEUTENANT NAMED CHRISTIAN



I remember every word he burned into me. "What are you up front, a 40-poun' rabbit?"

By RICHARD BACH

YOU KNOW the stereotype of an old-time flight instructor: a tough little man who talks hard, flies hard, and is terror on wings for any student who doesn't fly an airplane exactly the way he wants it to be flown.

This man has just about disappeared. In these days when businessmen learn to fly, a flight instructor is a master of tact as his students often are people more accustomed to giving orders than to taking them. Every once in a while, though, you run across one of the old-timer types, the raging, snarling kind you read about in yellowed copies of those I-Flew-With-Billy Mitchell books of yesteryear.

I met one of this type at the worst possible time—when I was learning to fly. I had rolled through the Air Force Aviation Cadet program with no more trouble than anyone else in my class. I had 150 flying hours in propeller-driven training planes and felt that I was well on my way to silver wings and fighter pilot status in the T-33 jet trainer. Then I was assigned to fly with First Lieutenant Robert L. Christian.

I should have had an inkling of what was coming, but I walked confidently to his briefing table and saluted, secure in knowing that Lt. Christian could find no fault with my flying, and therefore quite calm and sure that this flight would be like all the others. I should have remembered that Lt. Christian was the first jet flight instructor I had seen.

The first hour of our first day on the flight line was spent crowded in the squadron's briefing room, talking nervously about the flying we had ahead while we waited for our flight instructors to appear. The door slammed open, blasted aside by a straight-arm from First Lieutenant Robert L. Christian. Stunned by the force of his sudden entrance, it was a quarter of a second at the most before we snapped stiffly to attention at the cry, "ROOM . . . tinch-HOOA!"

In the utter silence that fell on our rigid bodies and wrinkled chins, we could feel a wave of displeasure.

"Oh, you boys have gawn soft," came a quiet drawl. "It used to be that the windows rattled when kaydets called the room. Don't they do that any more where you come from?" Silence from 30 unbreathing statues. "Don't they call the room where you come from?"

"Yes, Sir!"

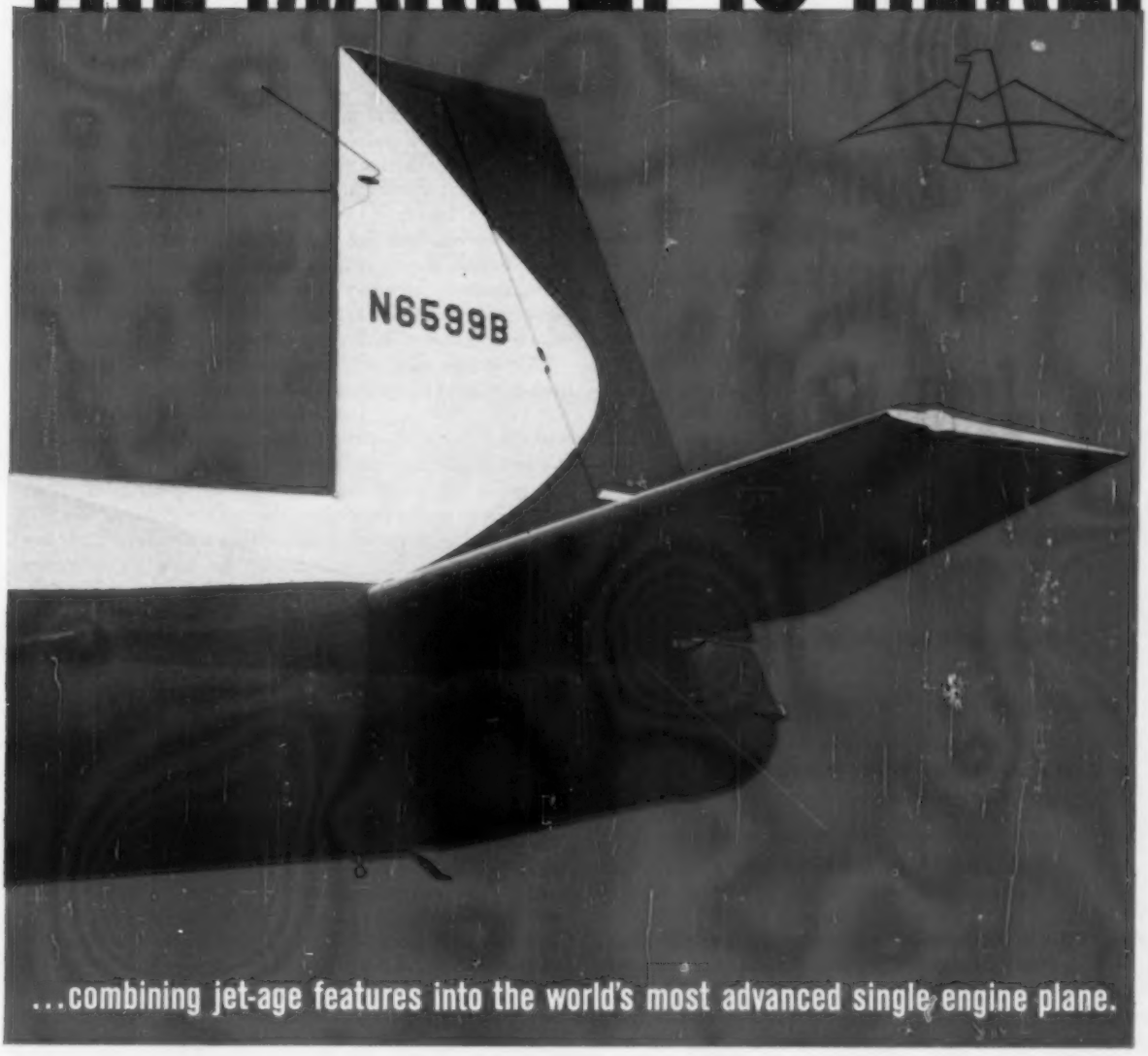
The quiet voice. "I was three feet inside that door before you finally decided to wander up to your feet. Aroun' here we like the room called to attention when we enter, not after we've been here five minutes." The sweet voice, the silky voice. "Do you understand that?"

"Yes, Sir!"

"Now let's try it again and find out if we can do a better job."

We tried it again three times before he was almost satisfied. "Gentlemen," he said after he allowed us to sit down, "Six months from today, on the day of your graduation, I'm going to lead a formation of five airplanes across the field, inverted, 20 feet off the ground. Do I have any volunteers to fly with me?" A scattered few cadets stood up. "Every one of you people sitting down," he said, and we could feel something coming, "had best knock off any stupid ideas you have about this program. This ain't no pussycat program. We're here to make tigahs out of you or to wash you out. You think that just because you had a good time flyin' the prop jobs you're really going to have fun here in jets. You think that this is an easy program and that all you have to do is live for another six months to get those wings. Let me tell you, gentlemen," he said in the silky southern voice, "If you think (*Continued on page* 100)

THE MARK 21 IS HERE!



...combining jet-age features into the world's most advanced single engine plane.

Here's why the MARK 21 is best in the realm of business aircraft:

ALL NEW—It introduces jet-age engineering advances to provide superior performance and economy long dreamed of in single engine business flying.

ALL METAL—It has the first all metal wing to retain the full low drag characteristics of LAMINAR AIRFOIL design.

ALL MODERN—Design features and production techniques from the fastest military jet to the newest airliner are blended with Mooney's "World's Most Efficient Design" to create the Mark 21.

CHECK THESE JET-AGE FEATURES IN THE MARK 21:

- New all-metal, flush riveted, aerodynamically smooth, WRAP-AROUND wing design.
- Jet transport integral wing tanks—a first for single engine business aircraft.
- Jet transport-type adjustable tail trim—provides complete cruise trim control.
- Jet type sealed control surfaces—insures better performance.
- New transport type "Z" spar structure.
- New dorsal fin increases lateral stability and speed.
- Simpler, more rugged, retractable tri-cycle landing gear.
- Powered by Lycoming's famous design, newly advanced 190 h.p. engine. The only 180 m.p.h. business aircraft utilizing a 4 cylinder engine—one-third less fuel, one-third less maintenance, and substantially lower replacement cost.
- New interior roominess provides perfect comfort through even the longest journey.
- Luxurious and functional interior styling; rich new fabrics highlighting color-keyed design.*

See and fly the MOONEY MARK 21—the most distinctive business aircraft flying today. Contact your nearest dealer or write:

* Styling by Fred M. Gore and Associates, Industrial Designers, Dallas.

MOONEY AIRCRAFT, INC. • KERRVILLE, TEXAS

NO. 248

I learned about flying from that!

Skimpy instruction in engine-out procedures made an ordinary problem the cause of a forced landing.

By JAMES C. DOWNS JR.

ONE OF THE PROBLEMS of the private pilot is that he meets "experience" alone and without help. Airline pilots have the benefit of having flown under almost every conceivable condition while in the company of their superior officers. Thus, almost every situation which arises has at one time or another arisen before during their copilot days.

I am, more or less, a typical businessman flyer. I took my first lessons just before my 50th birthday in a Tri-Pacer I had bought for that purpose. A year and 200 hours later I bought a Cessna 195. Still another year and 200 hours more and I purchased a Piper Apache.

Being by nature conservative, I had more than the average amount of instruction to prepare me for each of the milestones of my flying career. I wasn't in a hurry to solo originally, and I took a good deal of time to get checked out for my multi-engine rating. However, as the events I will relate prove, almost no amount of purely formal instruction really prepares you for actual emergency conditions. This was brought home to me one fall day when my wife and I were on a trip from Chicago to Fort Lauderdale, Fla.

We had taken off early in the morning of a beautiful, clear day with forecasts of good VFR over the entire route, then flew nonstop to Pensacola where we had lunch, and there loaded the main as well as the auxiliary tanks, as we always do when we can stand the weight. Thirty minutes after takeoff in normal procedure we switched to the auxiliary tanks and proceeded over Cross City and Orlando on a direct route from Orlando to West Palm Beach. Somewhere about halfway between Orlando and West Palm Beach I decided to shift back to the main tanks. As I usually do, I flipped the left tank switch and let the engine run for about five minutes to see that everything was working smoothly before I switched the right tank. When making the latter switch, the lever appeared to get fouled, and stuck about midway between its position on main tanks and its position on auxiliary tanks. Soon I felt the sudden yaw which accompanies the loss of power in one engine.

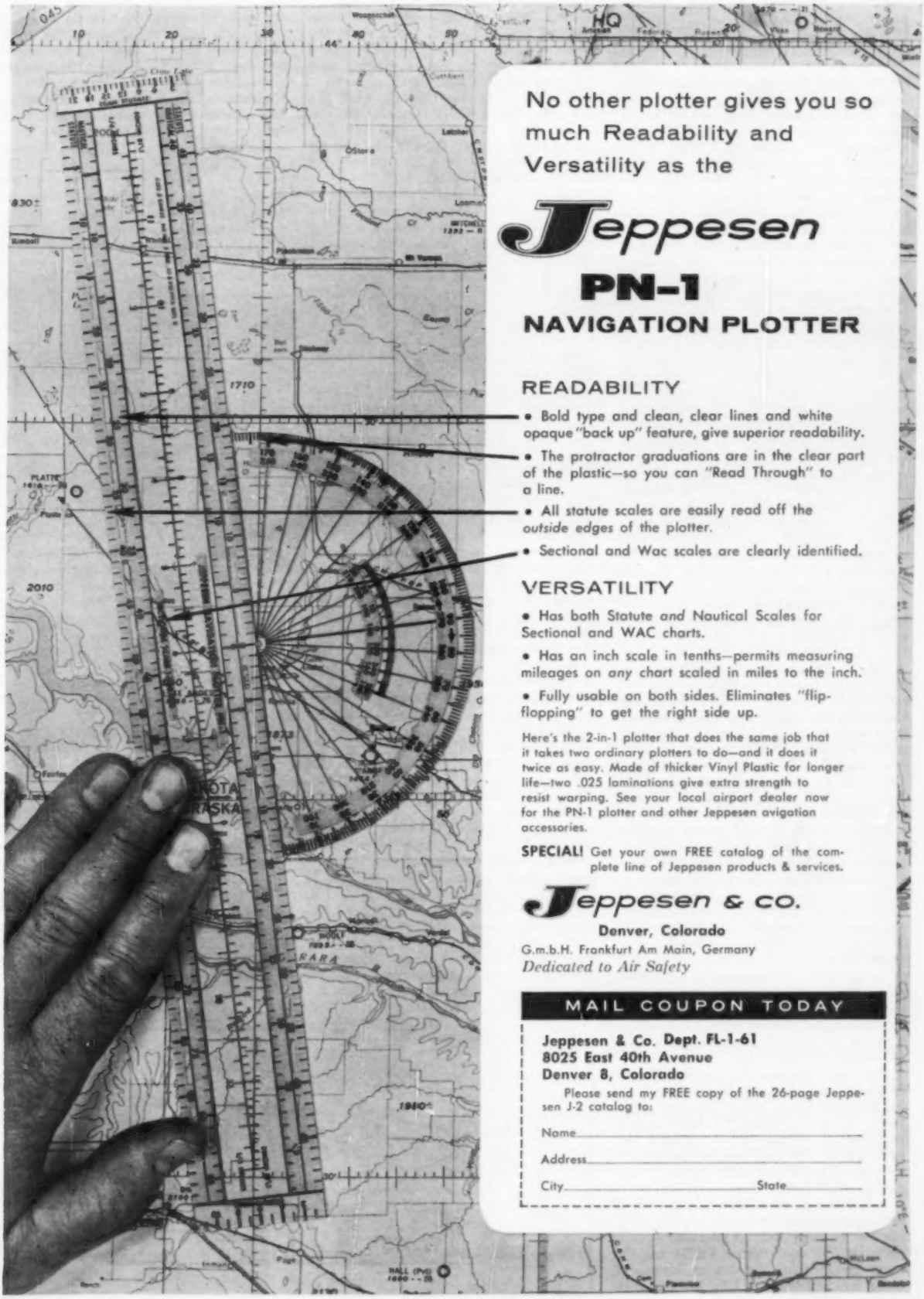
The simple and obvious thing would have been to switch to cross-feed and feed the right engine off of the left tank. Failing in that, the next obvious move would have been to feather the right engine and to proceed on the left engine. However, these were purely theoretical moves which had been taught to me in the calm of an instruction session with another pilot aboard. During such sessions conditions are either "simulated" or are deliberately created, and facing an actual emergency situation was something else again.

In the first place, I appeared to have forgotten completely the cross-feed procedure for it received little more than casual mention in my instruction. In the second place, I was reluctant to feather the right engine because the manifold pressure gauge showed only a small loss in manifold pressure and I wasn't at all certain that I was getting no power out of the engine.

By a stroke of good luck—which is easy in Florida where there is a paved airport almost every 10 miles—I found that we were only about four miles from an airport. We were at 3,000 feet at the time, just underneath scattered clouds, and I felt I could make this airport even though the drag of the right prop was causing us to lose altitude gradually. Good fortune and the winds were right so we could make a straight-in approach.

The great benefit to me of reading articles in flying magazines is the opportunity which it affords of gaining vicarious experience. I present this story of my own inadequacy as a pilot under the circumstances described as a means of encouraging other private pilots who operate multi-engine aircraft to take more than the instruction which is given for multi-engine qualification. Moreover, I believe it wise to get a good deal more practice on engine-out procedures than is normally taken in connection with original instruction. Fly your airplane with one of the engines without fuel and become thoroughly familiar with the behavior of the instruments when one engine is not producing power but is wind-milling, as it will until the prop is feathered. Get a more than theoretical acquaintance with the cross-feed system by actually shutting off the gasoline from one engine and feeding it from the opposite tank.

Needless to say, the 10 hairy minutes I spent learning this lesson were more valuable to me than the several hours of instructions I had before obtaining my multi-engine rating. END



No other plotter gives you so much Readability and Versatility as the

Jeppesen PN-1 NAVIGATION PLOTTER

READABILITY

- Bold type and clean, clear lines and white opaque "back up" feature, give superior readability.
- The protractor graduations are in the clear part of the plastic—so you can "Read Through" to a line.
- All statute scales are easily read off the *outside* edges of the plotter.
- Sectional and Wac scales are clearly identified.

VERSATILITY

- Has both Statute *and* Nautical Scales for Sectional and WAC charts.
- Has an inch scale in tenths—permits measuring mileages on *any* chart scaled in miles to the inch.
- Fully usable on both sides. Eliminates "flip-flopping" to get the right side up.

Here's the 2-in-1 plotter that does the same job that it takes two ordinary plotters to do—and it does it twice as easy. Made of thicker Vinyl Plastic for longer life—two .025 laminations give extra strength to resist warping. See your local airport dealer now for the PN-1 plotter and other Jeppesen avigation accessories.

SPECIAL! Get your own FREE catalog of the complete line of Jeppesen products & services.

Jeppesen & CO.

Denver, Colorado

G.m.b.H. Frankfurt Am Main, Germany

Dedicated to Air Safety

MAIL COUPON TODAY

Jeppesen & Co. Dept. FL-1-61
8025 East 40th Avenue
Denver 8, Colorado

Please send my FREE copy of the 26-page Jeppesen J-2 catalog to:

Name_____

Address_____

City_____ State_____

Airlift

(Continued from page 45)

by the State Department. Trans World Airlines flies the President's press entourage. Private industry, however—the newspapers, magazines, radio and television networks—paid the charter bills.

A generation ago business leaders would sponsor a company picnic. Social clubs arranged for a hayride. Civic clubs sponsored an educational tour through the local newspaper. These activities are still popular, and the same feelings that prompted the organizations to plan and pay for them have grown wings. Chartered airlifts assemble business associates by the hundreds from all over the country making it worthwhile to show them whole factories and lines of merchandise. They talk to the most authoritative sources of information, the top executives. And they enjoy resort food, lodging and entertainment. It's prompted by the desire to reward outstanding employees, kindle company loyalty, and keep the firm alive and growing by selling more of its goods.

Group charters have become one of the newest rewards by business firms through which American families get pleasure trips they couldn't otherwise afford for years to come. Many charters carry businessmen to professional meetings and demonstrations they would otherwise miss. Though the cost of chartering airliners is never small, most companies have reported it worthwhile, repaid either in increased sales or enthusiasm and higher morale.

AIRLINES keep their planes busy, particularly during their slack seasons, and their crews active instead of on furloughs. Charter business adds millions of passenger miles to their total operations. Domestic trunk lines flew 13,271 charters in 1959. For transatlantic carriers, charter trips amounted to 10 per cent of their 1960 business, up from six per cent only two years ago.

While not all of this charter business is in passenger airlifts for private business (some is freight and some defense or other government contract) a growing portion of it serves the people in private industry and their families. More than one domestic airline does at least a million dollars worth of charter business a year. A local service airline reported, "Charter business enabled us to do 53 weeks' business in a 52-week year." It must be noted, however, that coordinating planes between regular schedules and charter commitments requires considerable planning and sometimes causes dilemmas and headaches.

Ten years ago the Fedders Corp. paid for vacations in Bermuda, by chartered airlift, of 92 dealers in air conditioning equipment. Over the years the annual mass vacation trip has become so popular that sales quotas are met by the dealers for over 4,000 persons. Fedders figures it has paid for 22,000 week-long vacations.

A Fedders representative has the job of making arrangements for the trips by visiting resorts and hotels all over the world—preferably incognito in order to get the same treatment as the dealers instead of being handled like a V.I.P. For the 1960 Fedders tours, arrangements were made with two hotels in Israel, two in Paris, the Grand Bahama Club in the West Indies; and with El Al, Air France, Sabena, and Pan American World Airways.

Trips take place in the fall, when the season for selling air conditioning is over. Dealers then have some time on their hands, though many beat the bushes for extra business to earn a vacation trip for their wives or employees.

This fits in well with the operations of Pan American's Latin American division, which takes planes and crews off its regular schedules after the summer vacation rush and experiences a slack period until the winter resort traffic begins. Transatlantic flights have also tapered off from their summer peak, and planes are available from other airlines for the vacations in Europe and beyond.

For Caribbean-area flights the airline assigns one 81-passenger, four-engine DC-6B to start with, for the Fedders airlift. During part of the 10-week mass airlift Pan American may put two planes into the operation, and has used as many as four in some past years. Several crews divide the work.

Fedders and Pan American designate airports in 17 cities as central assembly points for the dealers and their wives. At each one a coordinator and supervisor check the vacationers for proof of citizenship and vaccination, and they remind them of the limits on bringing in gifts duty-free and the liquor requirements for their home states. During the night one aircrew flies the plane to one of the 17 cities, and carries the 81 passengers to an international airport such as Houston or Miami, where they clear the customs, immigration and public health services. The plane refuels, a new flight crew takes over, and they continue on to the resort. Here they pick up 81 people who have just completed their vacation week, and return them to their home city that night. The plane continues on to another city, and repeats its mission.

During the 1959 Fedders vacation airlift, which carried 3,800 people to Acapulco, Mexico, the charter schedule ran like this: Depart Miami before daylight Monday to pick up vacationers at Jacksonville, Fla. Land them at Houston International Airport, change crews and clear customs, and arrive at Acapulco at 9:54 a.m. Pick up vacationers and depart at noon, clear them through Houston, change crews and deliver the vacationers Monday night to San Antonio, their home city. Leave San Antonio and (it's Tuesday now) pick up a load of vacationers at Memphis during the night. Bring them into Houston, change crews, and continue on to Acapulco. Return the next load of people from Acapulco, through Houston, to San Antonio also and pick up half a plane-load of people at Little Rock, Ark., at 11:30 p.m. Tuesday and the others at Lubbock, Texas, at 1:50 a.m. Wednesday. The returnees from Acapulco on this round trip are delivered to their home city or assembly point, Dallas. Thursday the plane picks up people from Oklahoma City and that night returns vacationers to Houston. The outbound group Friday comes from Wichita, Kans., and the returnees go to New Orleans. From New Orleans the plane returns to Miami where it is needed to fly some regularly scheduled hops in the Latin-American service. Monday morning it's again on the Fedders airlift, perhaps this time across the nation in the New York-New England area.

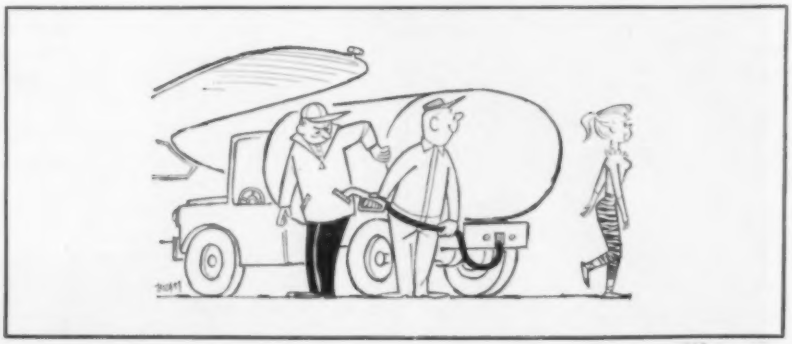
FEDDERS and Pan American figure they flew a million passenger-miles a week, for 10 weeks. During those weeks, an airline official estimated, the vacationers spent $1,500,000 of their own money on souvenirs, gifts and entertainment in addition to the program prepared by their company.

When Gibson Refrigerator rewarded outstanding dealers, salesmen and their wives year before last, it carried approximately 3,000 of them on 63 round trips aboard chartered Eastern Air Lines planes between various cities and San Juan, Puerto Rico. An airline spokesman estimates the group poured three million dollars into the economy of Puerto Rico that week. But no one is able to estimate what it did for the morale of the dealers or for the future sales of the company's refrigeration equipment.

When the J. I. Case Co. of Racine, Wis., prepared to introduce tractors with the world's first automatic transmission systems, company officials decided to make a bid to gain as much new business as possible. In the fall of 1957 the company invited several thousand dealers to come to Phoenix, Ariz., from all over the United States and Canada to view the new line, and drive the tractors themselves.

It took five airlines a total of 102 chartered flights to bring the dealers to Phoenix in groups of 300 to 400 each day—3,625 dealers in all, for three days each. The airlift, and three days' hospitality in Phoenix, cost the company $1,000,000 toward the total expense of its world pre-

(Continued on page 74)



Lloyd D. Catlin—President of Catlin Aviation Co. A veteran pilot, he has served aviation in Oklahoma City for 18 years.

Red Carpet Service at Oklahoma City

"Catlin's Hangar", Will Rogers Field, Oklahoma City—known for prompt and courteous service to all . . . "from Cubs to Connies"

A view of the new air-conditioned customer lounge. Operations Office Manager is Elizabeth V. Sewell.

He's built a reputation for top service. Line Supervisor, D. L. "Scotty" Scott takes over on a light twin.

At Catlin Aviation they're noted for "pampering" pilots, passengers and planes! Taxi in there the next time you land at Oklahoma City's Will Rogers Field . . . and see for yourself. Open 'round-the-clock, seven days a week, Catlin boasts a brand-new hangar (largest in the area) and a plush, air-conditioned lounge. Line service is prompt and efficient —featuring mobile refueling with Phillips *66* Aviation Gasoline (Grades 80, 91, 100, and 115) and JP-4 jet fuel . . . and an airline-type oil dispenser for larger planes.

One of the oldest aviation sales and service organizations in Oklahoma—Catlin is noted for the high calibre of their maintenance and overhaul. They also offer approved radio service, custom panels and auto-pilot installations.

For "red carpet service" ask ground control for "Catlin's Hangar". It's at the N. E. corner of the field—courtesy transportation to the terminal... tie down or inside storage.

★ ★ ★

New HD Oils . . . For Longer Engine Life

Never before could an aircraft oil promise so much! With improved additives, new Phillips 66 Aviation HD Oils provide top protection against pre-ignition, plug fouling, ring sticking and valve burning . . . keep engines cleaner for longer life, maximum in-flight reliability, and lower operating costs. Phillips 66 HD Oils meet Continental and Lycoming specifications.

AVIATION DIVISION • PHILLIPS PETROLEUM COMPANY • BARTLESVILLE, OKLAHOMA

PHILLIPS 66

Announcing 7

The Sensational New Beechcraft Model 55 Baron!

Newest, roomiest, and best-built airplane in its size class, this newest of all Beechcrafts has no equal among its competitors. Here is everything you would expect a new Beechcraft to be. With two new 260 hp Continental fuel injection engines, it cruises 216 mph at only 65% power. A wide choice of power settings gives the new Beechcraft Baron speeds up to 230 mph. Lots of headroom, hiproom and legroom. Room galore for baggage, accessories, extra radio. Before you buy any 4-to-5 place twin, be sure to see and fly this one— the brand-new Beechcraft Baron!

New Beechcraft Bonanza, with new Continental 260 hp fuel injection engine, now carries 152 pounds more useful load. Speeds up to 205 mph. Range, with reserve, over 1,200 miles. A wide assortment of new comfort and convenience features includes a new longer rear window for even greater visibility.

New Beechcraft Debonair has Continental 225 hp fuel injection engine, carries 4 people at speeds up to 195 mph. Range, with reserve, over 970 miles. Your choice of two attractive paint designs in 9 popular colors. Interiors feature new wider, softer seats, new apparel shelf and new improved ventilation system.

The new Beechcraft Baron, a completely new airplane with a completely new look! With two new 260 hp Continental fuel injection engines, it has speeds up to 230 mph. Carries 4 to 5 people in unmatched luxury in individually reclining seats. Room for baggage, too. Range, with reserve, over 1,200 miles.

Exciting Beechcrafts for 1961

The new Beechcraft Super G18 has even greater comfort and performance. Seats 7 to 9 people. Speeds up to 233 mph. Range, with reserve, over 1,450 miles. New features include new panoramic picture windows, new super sound-proofed pilot compartment door, plus completely new luxury-crafted interiors.

Once again... Beechcraft brings you the best-built, most thoroughly satisfying airplanes ever offered:

Name the things you want in your next airplane. Jot them down. Now go over them again and add any you forgot to include. Got 'em all?

O. K.! Just be sure to take that list with you when you go out to choose the new airplane you're going to live with for the next few years. Check every plane you consider against that list. If you do, and if you're the kind of man who gets what he goes after, we already know what your choice will be.

You'll buy a Beechcraft.

And when you do, you will become a member of a mighty select group. A group that is growing rapidly. A group, in fact, that gained more new members in 1960 than ever before.

With all of these people you will share a deep and lasting pride in your airplane. And with them, too, you will share the knowledge of an indisputable fact about business airplanes:

There is nothing — absolutely nothing — like a Beechcraft.

There's a reason. We put more into it in order that you will get more out of it. It's the way we think airplanes should be built. It's the Beech philosophy.

Why settle for less? There's a Beechcraft for you. Beechcraft distributors and dealers will be happy to show them to you. Why not drop around and see them . . . soon!

New Beechcraft Queen Air carries 6 to 7 people in quiet privacy. Big separate pilot compartment. Plenty of room for dual instrumentation and panel-mounted radar scope. 340 hp supercharged fuel injection engines. Speeds up to 239 mph. Range, with reserve, over 1,200 miles. Private lavatory. Walk-in baggage area.

New Beechcraft Twin-Bonanza features include new dual controls, new scientifically placed instruments, floor-mounted control pedestal, new added visibility with the addition of a new cabin window aft, plus new "unitized" electric starting system. Speeds up to 235 mph. Range, with reserve, over 1,325 miles.

Famous Beechcraft Travel Air cruises over 3 miles a minute, yet uses little more fuel than many single-engine planes. Carries 4 or 5 people in luxurious comfort. Plenty of room for baggage. So quiet inside—and so easy to fly—you'll hardly believe it. Speeds up to 210 mph. Range, with reserve, over 1,150 miles.

Write today for latest information on low-cost Beech financing and leasing plans. Address: Beech Acceptance Corp., Wichita 1, Kansas, U.S.A.

Beechcraft

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

nova/Star OMNI

- **2 Degrees Guaranteed Accuracy**
- **Meets IFR Requirements**
- **All Transistor Circuit**
- **Automatic "TO-FROM" Meter**

The Nova/Star **OMNI** weighs only 12 ounces and easily mounts in a standard instrument hole. It operates with any major make VHF receiver, and provides the pilot with reliable long-range OMNI navigation.

Nova/Star OMNI **$385**

TR-102A Most popular low cost VHF transceiver. 23 channel transmitter, tunable receiver, operates headsets with plenty of volume to spare. 60 to 100 mile range.

TR-102A . . . price* **$229
2 crystals and antenna

Nova/Star Executive Radio Includes these high quality features: Whistle Tuning, Cabin Speaker, Powerful Audio Amplifier, Built-in Interphone, 10 Crystals installed, room for 13 more. Ideal primary or stand-by radio.

Nova/Star . . . price* **$385
10 crystals and antenna

Iron Clad Money Back Guarantee
NOVA-TECH INC.
1721 Sepulveda Blvd., Manhattan Beach, Calif.

Please send_____

☐ Nova/Star Omni . . . . . @ **$385**
☐ TR 102-A VHF Transceiver . . . . . @ **$229**
☐ Nova/Star Executive VHF Transceiver . . . **$385**
☐ Complete Information on Item Checked.

NAME_____

ADDRESS_____

CITY, STATE_____

(Continued from page 70)

miere of tractors with automatic transmissions.

"When the show began," said Marc B. Roitman, executive vice president, "we said we would consider it a success if it produced orders from the dealers totaling $75 million. This seemed a formidable goal, considering our sales for all of 1956 had been only $87 million.

"We were delighted to report orders totaling $155 million. Our world premiere was an unqualified success."

The company made money from the showing in an unexpected way, also. Normally they estimate what models are likely to be ordered and equip them accordingly during the first few weeks of production of the new models. Later on, when the orders come in, many models have to be modified to fit the exact specifications of the dealers' orders. From their world premiere, however, the company got firm orders specifying exactly what models and what accessories each dealer needed. They didn't have to alter much of the first production. This saved the company $3,500,000 they estimated. Subtracting the $1,000,000 cost of the world premiere, it was a net financial gain of $2,500,000.

More than half the people airlifted on Case's first World Premiere had never flown before, the company discovered--2,000 of the 3,625. Repeaters on the 1958 premiere cut the total of first-flight passengers to about half of the newcomers. Case kept no figures, but perhaps 500 got their first flight in an airliner the second year.

Pan American officials estimate that half of the dealers and wives take their first flight in an airplane when they board their first Fedders airlift. This means about 12½ per cent of the total airlift each year, close to 500 people. (About three-fourths of those on each annual vacation trip are repeaters, and only one-fourth are newcomers. Of these about half are flying for the first time.) Rewards and incentive trips to vacation spots thus introduce several thousand people to airline flying each year.

BOTH Case and Fedders maintain permanent departments within their own companies to plan and arrange the annual trips. In 1957 Case called on five different airlines, seven in 1958 and 1959, with United Air Lines coordinating the schedules for all. The 1957 Case airlift totaled 12,600,000 passenger-miles—the most in charter flight history. But it was surpassed by the 1958 airlift, which required 19,326,000 passenger-miles. That airlift yielded the record to the 1959 operation, which shuttled a total of 23,500,000 passenger miles. Held in Miami, the 1959 world premiere caused Case to lease the old 36th Street Terminal Building at Miami Airport from Eastern Air Lines.

"We had an aircraft movement every 15 minutes on operation day," project coordinator Cole Morrow, recalled. "At the hotel it was necessary (on the average) that we check in or out one person every seven and a half seconds and handle a piece of luggage every four seconds. It required 18 air-conditioned buses, moving continuously, to handle the passengers.

"A tremendous amount of work is required to establish the best operating pattern, and to coordinate the scheduling and operations of several airlines after the pattern is established."

The schedules of big league baseball teams provide the airlines with another opportunity to meet a complex need with an intricate and carefully coordinated schedule. During 1960 the 16 major league teams traveled 277,492 miles on 444 flights, a total of 12,487,140 passenger-miles. Cincinnati, which made the first chartered baseball flight 25 years ago, made the most flights this year—40. The Milwaukee Braves and the Cincinnati Reds each flew on jets on five trips.

Baseball enthusiasts have pointed out that it wouldn't have been possible for Los Angeles and San Francisco to enter the major leagues if it weren't for the ability of the various teams to telescope their travel time by chartering airplanes. The Los Angeles team, incidentally, augments its charter schedule by flying short hops between cities in the east on a team-owned plane. And Capital Airlines kept a crew standing by in suspense at Cleveland in 1954 while the Indians fought to remain in the series and prevent a four-game sweep by the New York Giants — which would have meant a postponement of the return flight to New York until after another game. But the Giants ended the fourth game victorious about 4 p.m., left Cleveland airport at 6 p.m. in two chartered airliners, and arrived in New York in time to celebrate at a victory party at 9 p.m. that night.

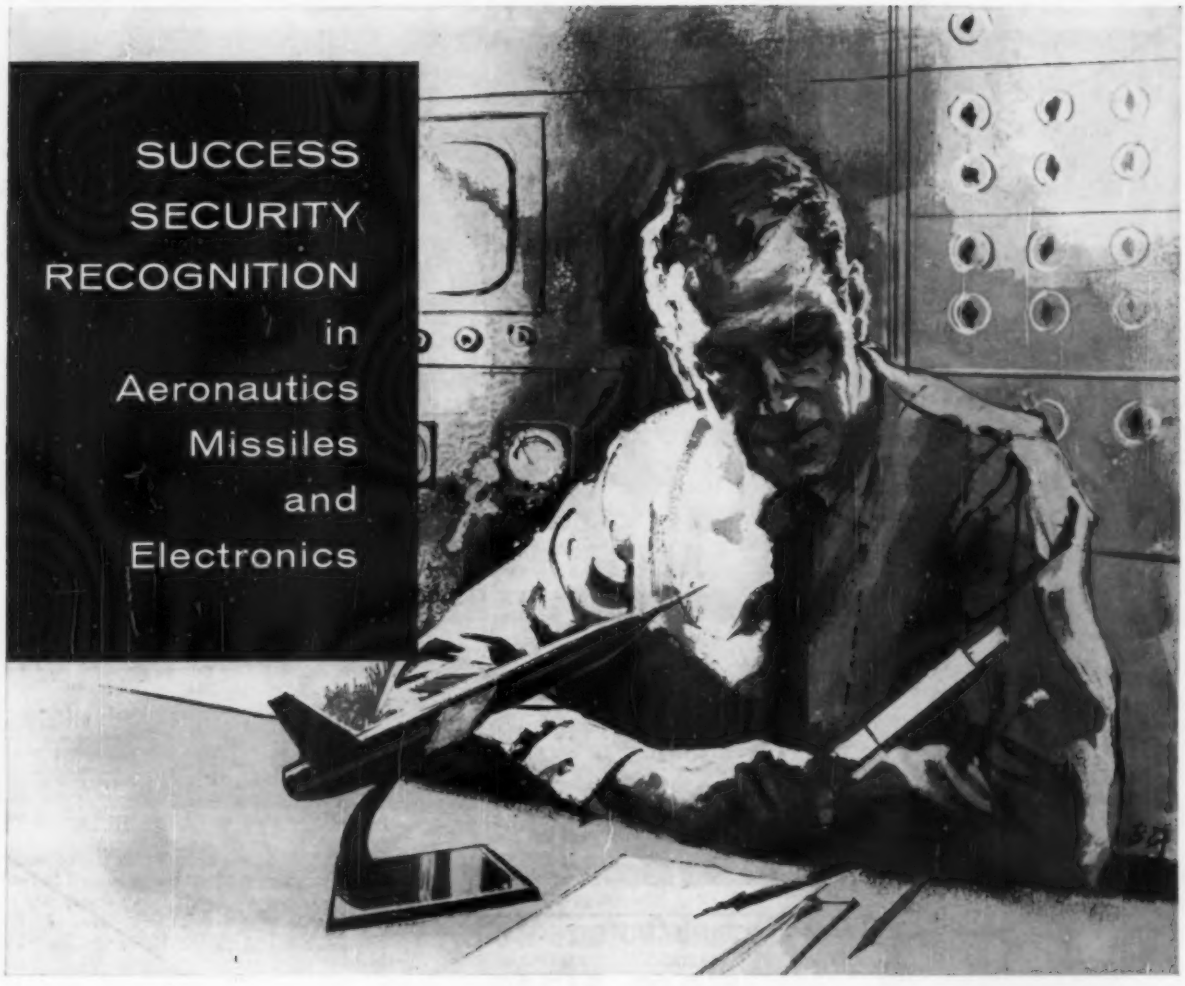
Chartered flights carrying football teams to intersectional games aren't new, but alumni and other fans are popularizing charters to carry them to watch the games. A chartered airliner has enabled more than one high school football team to play a state championship game on the other side of the state without missing too many classes. But one professional football team ran into a snag this fall when airline officials discovered that a planeload of 250-pound guards, tackles and fullbacks—plus their equipment—amounted to more tonnage than their planes are certified to carry.

The gradual changeover to jet airliners has prevented some airlines from handling as much charter business as business firms have asked of them. Continental Air Lines estimated it had to turn away as much business as it handled. By next year it appears there will be enough jets in service to enable all airlines to accept all the charter business they can find. The longer charter flights keep their piston-engine planes busy, the fewer planes will arrive on the used-plane market where prices are already far below the pre-jet levels.

Some airlines don't push charter services. They encourage business firms to use their regularly scheduled flights. "Our prime responsibility is to run the best *scheduled* airline in the business," commented a spokesman for American Airlines, which estimates it does less than one-tenth of one per cent of its total business in charter operations.

Northeast Airlines, like American, arranges its group business on regularly scheduled flights. Traveling in groups on 30 different scheduled flights over a period of two and a half days, over 1,000 members of the National Canners Assn.

(Continued on page 76)



SUCCESS

is just about 100% certain for the educated young man who dedicates himself to the rapidly-expanding Space Age—like the thousands of Northrop Institute graduates who are receiving high incomes and enjoying a large measure of success.

SECURITY

is theirs, too—the solid kind of security which is based on ability. This is the type of ability developed by successful students at Northrop Institute of Technology, as evidenced by the rapid advancement made by NIT graduates into positions of responsibility and leadership.

RECOGNITION

from top management, fellow employees, family and friends. Many honors, in fact, have been received by NIT graduates for their outstanding contributions to American industry and to the Space Age.

AND YOU TOO

can achieve all this and more — if you are interested in a career in aeronautics, space age activities or electronics, — and if you get the right start with the proper educational background. NIT offers complete Bachelor of Science Degree Programs in Aeronautical, Astronautical, Electronic and Mechanical Engineering, as well as 2-year Technical Institute courses in these same fields.

Northrop Institute
of Technology

A privately-endowed, non-profit College of Engineering
1102 W. Arbor Vitae Street, Inglewood 1, California
Mail coupon for complete information

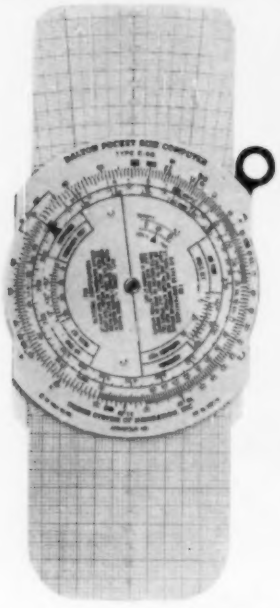
NORTHROP INSTITUTE OF TECHNOLOGY
1102 W. Arbor Vitae Street, Inglewood 1, California
Please send me immediately the Northrop Catalog.
I am interested in a career in the field of:

- ☐ Aeronautical & Astronautical Engineering
- ☐ Electronic Engineering
- ☐ Mechanical Engineering
- ☐ Aircraft Maintenance Engineering
- ☐ Airframe & Powerplant Maintenance
- ☐ Jet Engine Maintenance

Name ..... Age .....
Address .....
City ..... Zone ..... State .....
Veterans: Check here ☐ for special information.

WEEMS
AIR NAVIGATION AIDS AND INSTRUMENTS
"Around the World for 30 Years"

NOW-THE POCKET SIZE



E.6B ALUMINUM COMPUTER

the old favorite in the new size

The world's most widely used and most copied computer *only*

$12.50

STANDARD SIZE E-6B	
PLASTIC	ALUMINUM
$10.00	$12.50

For high speed and overseas flight, specify another original . . . the Dalton E-10 Computer (U.S.A.F. MB-4). **Plastic $12.50 . . . Aluminum $15.00**

For these, and other products in the Weems line, see your Weems distributor, or his Airport dealers. For free catalog, write us direct. Address Weems System of Navigation, Inc., Dept. 3, Annapolis, Maryland.

WEEMS
The trusted name in air navigation . . . . . SINCE 1928

Two 3200' turf landing strips. Deluxe hotel rooms and cottages. Compass Room Restaurant and Bar, swimming pool. Season: Oct. 14 to June.

FLY IN!

Desert Air

HOTEL & RESORT
PALM DESERT AIRPARK
P.O. BOX 1270-B • PALM SPRINGS
CALIFORNIA

For Reservations: Write or Phone:
FAirview 8-3101

DRIVE IN!

PILOT TRAINING
FOR PRIVATE, COMMERCIAL & INSTRUMENT RATINGS

Thorough programs covering all subjects required for FAA Private, Commercial & Instrument written exams. Simulator instruction covers cross country and airway flying. Link included. Classroom instruction: Radio Navigation, Meteorology, Air Traffic Control, Civil Air Regulations. Write or phone:

AIRLINE OPERATIONS TRAINING, INC.
AT INTERNATIONAL AIRPORT
Belt Pkwy. & Rockaway Blvd. Jamaica 34, N. Y., FI 1-3600

METAL CONVERSIONS for Piper, Stinson, Cessna, Ercoupe
WRITE FOR BROCHURE FD-1
Call collect TUxedo 2-6400 for reservations
SKYCRAFT Mercer County Airport West Trenton, N. J.

(Continued from page 74)

assembled last winter for a three-day convention. Northeast planners aided them to fly together and sit together.

The airlines generally expect charter business to grow, and grow rapidly. Pan-American reports passenger business charters have increased 15 per cent a year, and the airline looks for it to continue increasing at that rate. Delta Air Lines carried about 6,000 persons on 102 charter flights this year, earning $415,000, and expects to earn $750,000 next year on 300 charter flights. Says its president, C. E. Woolman, "In this area, there is room for new growth throughout the air transportation industry."

How can you expect other than rapid growth from a service which offers private industry so many unique opportunities? When United Gas Corp., for instance, wanted to show investment bankers a picture of its extensive producing and transmission facilities, it didn't weary them with more graphs and charts. From New York, Boston and Philadelphia, two DC-6B's chartered from National Air Lines flew the bankers on a week's tour of the company's properties at Tucson, Shreveport, Mobile and Pensacola—Arizona to Florida.

And when an oil company wanted to train some new geologists, fresh out of college, it set up public address systems in two Trans-Texas Airways DC-3s. Each young geologist was stationed at a window, while a veteran company geologist described the strata and formations of the terrain as they flew some hundreds of feet above it.

The emotional impact of a fall or winter vacation in a tropical resort is hard to beat, and chartered company vacation flights increase the enjoyment of life that employees, associates and their families can look forward to. END

FLYING CALENDAR

January 9-13—International Congress and Exposition, of the Society of Automotive Engineers, Cobo Hall, Detroit, Mich.

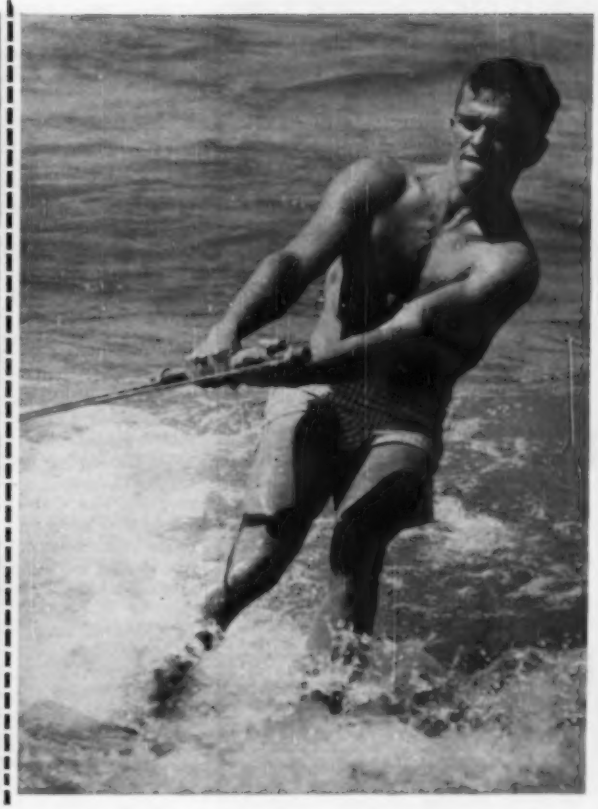
January 12-13—Eighth Annual Meeting, Arizona Aerial Applicators Assn., Wigwam, Litchfield Park, Ariz.

January 16-18—Seventh Annual National Meeting of the American Astronautical Society, Dallas, Tex.

January 23-25 — Twenty-ninth Annual Meeting of the Institute of the Aeronautical Sciences, Hotel Astor, New York City.

February 11—Sportsmen Pilots Handicap Air Race, Proficiency Contest Number 20. Covers 210 miles nonstop over triangular course in the Colorado River Country. Starts and finishes at Thunderbird Field, Las Vegas. Contact: Thomas C. Buck, 13106 Galway St., Garden Grove, Calif.

Calendar items must be received by FLYING's editorial office, 1 Park Avenue, New York 16, N. Y., two months prior to the event.



There are 2 stimulating sides to STUDY/PLAY in Air-minded MIAMI

Specialized professional training at Embry-Riddle . . . and sunny beaches minutes from classrooms. Both are yours . . . a great combination!

There's no place like Miami with its perfect climate for aviation training and outdoor fun . . . and no Aeronautical Institute like EMBRY-RIDDLE, close to the world's largest airport with its more than 20,000 employees. Embry-Riddle graduates have stepped directly from the classroom to the payrolls of Eastern Airlines, Pan American, National, Delta, Capital and others. *Free placement service.*

Whatever course you select (see listings in coupon) you can be sure of maximum training in minimum time. You'll save money, too. Embry-Riddle's individualized *professional training* will qualify you *quicker* for the career you want in aviation.

Embry-Riddle's international reputation is the cumulative result of 34 years of constant up-grading, the most modern laboratory equipment and aircraft, and a staff of supervisors and instructors that combines the utmost competency and exceptional experience—for which there are no substitutes.

Interested? . . . then mail the coupon now

FOUNDED 1926

Embry Riddle

AERONAUTICAL INSTITUTE

An Accredited Technical Institute

AVIATION BUILDING • MIAMI 52, FLORIDA

For other courses, see page 6

FREE!
80-page book

"Your Bright Future in Aviation." Written especially for young men who are "going places."

DIRECTOR OF ADMISSIONS
Embry-Riddle Aeronautical Institute
Dept. D, Aviation Building
Miami 52, Florida

Without obligation, please send me your Free 80-page Book and full particulars about the course(s) checked.

Print Name

Address

City State Age

- ☐ Aeronautical Engineering Technology
- ☐ Aeronautical Draftsman
- ☐ Airframe & Powerplant Technician
- ☐ A & P Combined with Commercial Pilot
- ☐ Business Pilot (with University of Miami)
- ☐ Executive Pilot
- ☐ Commercial Pilot
- ☐ Instrument Pilot

FABULOUS LIFE-TIME KANE MK-6B COMPUTER

Has special drift and density altitude scales. Airspeed-altitude computations accomplished directly using fahrenheit or centigrade. With leather case and direction manual. *LIST 15.00*

Introductory Price **$8.85**

KANE SKYKING COMPUTER

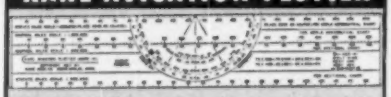
GUARANTEED FOR LIFE

All metal . . . pocket size design of Mark-6B Computer. With leatherette case and direction manual.

LIST $5.00

Introductory Price **$2.50**

KANE AVIGATION PLOTTER



Acclaimed the greatest advancement in plotter design. Precision engineered — simple to operate — crystal clear. Molded vinyl with beveled edges — not a sheet stamping. Dimensions: 16 x 3 x 3/16 inches. For sectional and WAC charts. Outer scales in statute miles, center scales in nautical miles. Similar to current Air Force type. In leatherette case with directions. List $5.00

Introductory Price **$2.50**

FAA EXAM AIDS

BASED ON THE NEW FAA REQUIREMENTS

PRIVATE PILOT EXAM KIT $3.50

New Dallas chart X-country answers explained and illustrated. With CAR Manual.

COMMERCIAL PILOT EXAM KIT

New WAC 409 and 358 X-country answers explained and illustrated. With CAR Manual..... $3.50

NEW POWERPLANT MECHANIC EXAM

With oral and practical phase.....$3.50

NEW AIRFRAME MECHANIC EXAM With oral and practical phase... $3.50

1960 C A R MANUAL $1.25

NEW PILOT LOG BOOK $1.00

Coincides exactly with FAA forms — 342 and 355. FLIGHT TEST APPLICATION RQTS.

MONEY BACK GUARANTEE
ORDER FROM YOUR DEALER OR

KANE AERO EQUIP'T
MANUFACTURERS AND PUBLISHERS
1845 FORD PARKWAY
ST. PAUL 16, MINNESOTA

Are The Blimps Through?

(Continued from page 37)

improve the state of the art."

First, he says it's a better, more efficient electronic platform for surveillance of missile test ranges than the surface ship or the airplane—Lakehurst-based ships are already standing this duty. "The airship operating at 3,000 feet, provides better radar coverage and electronic relay stations from a fixed-position platform than anything on the surface and obviously better than an airplane whose over 100-mph minimum speed forces it to move in a wide area."

The veteran skipper believes that the airship improved to its full potential can be used as a missile base supply vehicle for land or sea missile pads. "No landing strips are required." Materials and personnel can be landed by cable cars or lift.

"In the nuclear age, the vehicle is better for visual surveillance of coastal areas than anything else that could be designed. It would also be invaluable for patrol of real estate contaminated by nuclear blasts." In rescue and emergency service to disaster areas, it is worth "many, many helicopters."

DRAWING upon his quarter century of experience in lighter-than-air, Capt. Eppes, a native of Alabama and member of Naval Academy Class '35, believes these improvements are possible:

- Increased speed through reduction of drag by boundary-layer control systems and change of envelope shape. (Bureau Air has conducted studies and research.)
- Development of a powerplant tailored to lighter-than-air requirements.
- Larger and more slowly rotating propellers should provide greater efficiency than airplane types now in use. Also, aft location of propellers should provide better air flow along the envelope.
- Use of new materials—such as Dacron—which are lighter in weight but stronger than the present rubberized cotton fabric.

"From studies already completed," he goes on, "it seems to me that cruising speeds of 60 kts. are reasonable expectations with top speeds ranging from 85 to 90 kts. Such speed improvements alone would make the airship more than a match for the long-range AEW and ASW aircraft."

Just a stone's throw from Capt. Eppes' office, another airship careerman directs the single USN airship wing, consisting of ZP-3 long-range, early-warning squadron and ZW-1, an anti-submarine unit. He is Capt. Frederick H. Klein Jr., leader of the nation's 800-plus airshipmen.

Captain Klein is firm in his belief that the non-rigid airship is best suited for anti-submarine warfare, and he does not agree with proponents of the rigid airship and its proposed use as an airborne command post.

In fact, he is a champion for the smaller, faster and more flexible non-rigid type of airship. He has plenty of company within the lighter-than-air family from people who believe the airship has become too large and too restricted because of its size. Smaller airships would be less expensive to build and cheaper to operate and would offer higher utility. He cites the K-Ship as an example of a craft that could use a tree as a mast. Such a vehicle should have between 600,000-800,000 cubic feet displacement, a powerplant designed for airships instead of the present day "tank-type" engines and be capable of speeds up to 150-mph.

Wing One's skipper says the coming of the nuclear submarine, with its ability to remain under the surface for indefinite periods, to run silent and run deep, to launch missiles while submerged, forces diversion of emphasis from long-range anti-submarine equipment to the procurement of quantity in shorter ranged ASW vehicles having plenty of staying power and on-station reliability.

In this department he feels the small airship has the edge over other systems such as helicopters, faster-flying aircraft and carrier task forces. Search areas will be concentrated nearer the coasts instead of 1,000-plus miles at sea.

An endurance operation unparalleled in naval airship history was conducted in the winter of 1959 and 1960 by Lakehurst's ZP-3 anti-submarine patrol squadron. Beginning in September and ending in March, the project demonstrated the airship's reliability in sustained 40-hour periods of on-station patrol by each airship, while employing a modern new system of submarine detection.

Klein is proud of the results achieved during the period, which included the severest winter weather ever recorded off the Atlantic coast. Ships and crews maintained 1,277 hours of on-station time for a coverage factor of 88.6 per cent.

The exercise, including ZP-1 craft assistance, required airship utilization of 205.9 hours per month and crew averages of 164.7 hours.

Single on-station missions ranged 55 hours and over. Proponents of airships say this performance not only excels previous airship records but also is a challenge to other types of patrol units.

With this demonstrated capability, Navy men bemoan the fact that airship strength of 13 craft is lower than at any time since the beginning of World War II. At that time the Navy had no operational craft, and six old blimps which were forced into coastal patrol service. Twelve of its present AEW and ASW airships are at Lakehurst and one is at South Weymouth, Mass. standing electronics test duty.

IF PRESENT operational levels are not maintained and the state of the art is not advanced, airship proponents such as Capt. Klein see the end of the line in trained crews and pilots. At present there are 892 pilots qualified, but straight airship pilots have not been graduated since 1948. The average age of the present pilot roster is well into the thirties. Limited operations make it difficult to maintain crew proficiency.

Most of the new pilot personnel entering the program are experienced in powered aircraft. Capt. Klein says, "Once these men get over the feeling that they have been sent to Siberia, and gain a working knowledge of the mission and its equipment, they become strong supporters of the program."

In moving from Lakehurst to Washington and the Pentagon side of the story, one important issue centers around the occasional storm brewed by proponents of the rigid airship. They want Pentagon planners to restore these giant vehicles to use.

IT IS evident that such tactics arouse the opposition of airship men within the Navy as well as the top brass. One high ranking lighter-than-air expert said, "All these periodic publicity outbreaks do is to muddy the water for those of us who have a practical mission to perform."

The climate in Washington runs either cold or warm depending upon those involved. Those working with airships and free balloons start the "hard sell" the instant interest is shown in the gas bags. Those unfamiliar with the vehicles, and trained in heavier-than-air craft, missiles or surface ships scoff at the thought that old-fashioned airships have a space-age mission.

In a small, dingy office in temporary building T3, at Constitution Ave. and 17th St., N.W., where Office of Naval Research scientists cluster, there's a man who radiates faith in the future of lighter-than-air craft. He is a free-balloon pilot and physicist who has explored the edge of space—Cmdr. Malcolm D. Ross (USNR). His tireless work on Skyhook, a high-altitude meteorological experiment, and his trips to the edge of space three times via plastic balloons have given the mission of balloons in space exploration realistic potential and new hope.

For his three scientific balloon flights into the stratosphere with his copilot, Lt. Cmdr. M. L. Lewis, he was awarded the Harmon International Trophy (Aeronaut) in 1957. The 1957 flight established an unofficial world altitude record of 86,000 feet for a two-man crew.

Once the dollar blockade has been broken, Ross foresees rapid utilization of the free balloon and perhaps advanced versions of the non-rigid airship as edge of space platforms for study of the earth itself and the universe beyond. He believes this lighter-than-air vehicle is ideally suited as an inexpensive strato-laboratory where stable, stationary positions are necessary for scientific space orientation and for commercial or military missions—such as TV relays, or 20-mile-high observation posts.

From a military point of view the free balloon has many missions, ranging from stratosphere surveillance to TV and photographic plotting of weather, missile detection, radiation measurement and missile launching.

When Capt. Joseph W. Kittinger Jr. of the USAF aero medical section stepped from his plastic balloon 102,000 feet above the earth, to return safely by parachute, he demonstrated man's arrival at the point where he can survive in the hostile environment of outer space. Kittinger's successful ascent and descent open the way for productive use of the platform.

Ross believes new materials and techniques will hike the strength of balloon envelope and thus raise payloads and operating altitudes. A new Mylar-Dacron being developed by DuPont is eight times stronger than Polyethylene and is cited as one example.

The place of the balloon in astrophysics and meteorology will be enhanced as a three-ton load is soon to be lifted to 80,000 feet. There a 36-inch telescope and relay equipment will transmit details of space to low-flying planes and earthbound receiving stations. The project involves Office of Naval Research, Princeton University, Vitro Corp. and others.

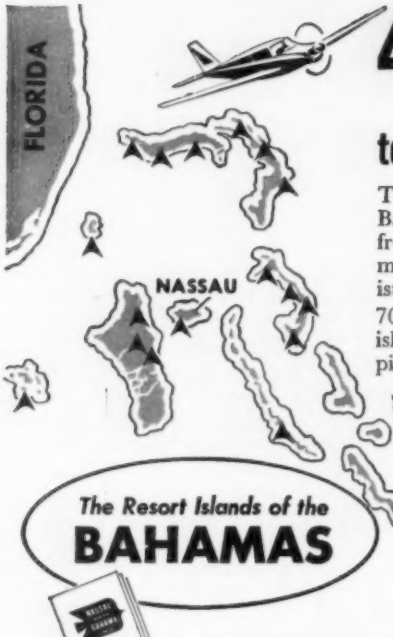
From the scientific family comes an observation by Dr. Fred L. Whipple, director of the Smithsonian Astrophysical Observatory. He told the House Space Committee's panel on science and technology that one of the least expensive and valuable backups to the space program is the high-altitude balloon. He lauded the support given it by U. S. Navy's ONR and to some extent by the Air Force. He estimated that balloon edge-of-space research would produce benefits from 10 up to 100-to-one over satellites and space probes in terms of practical results.

BALLOONIST Ross says his ONR free-balloon projects budget a token sum of $150,000 annually. Other organizations contribute to the "kitty" and thus help make scientific missions practical. He believes that NASA and other interested organizations—U. S. Weather Bureau, National Science Foundation, the Army and others could well afford to join in a coordinated effort that would advance the scientific frontier and still not siphon funds from the more glamorous and exciting missile and satellite projects.

Training in human environment alone,

(Continued on page 80)

Approved PROVEN and accepted!
Sales figures tell the story—The Number One Civilian helicopter in America today at any price is the Brantly B-2.
Since F.A.A. certification 18 months ago, Brantly sales have shot to the top spot in the helicopter industry. And for good reason.
Never before has a 'chopper' been so "wrung out." Engineered dependability is what we call it—you'll call it "a snap to fly" (3-5 hours to solo).
Ask the pilot that's flown a B-2—he'll be our best endorsement—and after you try it, you will be, too.
Consumer acceptance response has been beyond our expectations. Prime dealerships available in certain areas. Write or call today for descriptive literature.
AMERICA'S LOWEST AT
$19,950
27 DEALERS NATIONWIDE—9 FOREIGN
Brantly
HELICOPTER CORPORATION
5049 MARTIN ROAD ELKHART, INDIANA



45 minutes to paradise!

This winter come island-hopping in the Bahama Islands, just a 50-mile flight from Florida. You'll find it one of the most magnificent journeys a flying tourist could undertake.

70,000 square miles of beach-ringed islands, crystal seas, keen sport and picturesque resorts. 20 *air strips*, none more than one hundred miles from another. No passports, no red tape. And even in winter, the weather's CAVU.

The Resort Islands of the
BAHAMAS

FREE!
Folder, with flight tips, map, regulations and accommodations.

F-1-61

BAHAMAS DEVELOPMENT BOARD
608 First National Bank Bldg., Miami 32, Florida.
Please send information about flying in the Bahamas to:

NAME_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

THE Rock Sound CLUB

on the Island of Eleuthera

FOR THE FLYING SPORTSMAN!

Rock Sound's private airport with a 4500 foot East and West runway licensed for commercial Transport traffic has ground to air communication in daylight hours. The airport is a Port of Entry with Customs and immigration for arrivals direct from the U.S. Luxurious guest rooms, golf, tennis, game fishing and all water sports with a country club atmosphere!

SEE YOUR TRAVEL AGENT
or Int'l Reps: Robert F. Warner, Inc.
New York • Boston • Chicago • Washington
Toronto • London

(Continued from page 79)

via space balloons, will pay handsome dividends, according to the Harmon Trophy winner.

In spite of its many friends and boosters, lighter-than-air operations and development projects find rough competition for Navy dollars. Vice Admiral Robert W. Pirie, deputy chief of operations (air) has the thankless task of working out appropriations in accordance with priorities—the balloon and the airship are way down the totem pole. And it is recognized by Navy men that this orphaned part of the service must wait until missiles, satellites, carriers, ships, planes, helicopters and others get their bite of the defense money. Lighter-than-air craft get nothing but the few crumbs left.

Whether the balloon or airship may go to further fame and fortune or to undeserved oblivion depends upon its scientific, military and industrial champions winning a niche for LTA in the space-age budget. The future of LTA depends upon science taking a practical, more economical course by backing up satellite and missile exploration of space with the cheap, handy and unexciting gas bag.

Sideline boosters and observers such as "Mr. Airship," Admiral Charles E. Rosendahl (Ret.) say leadership is the single, all-important ingredient. From it lighter-than-air will earn a new lease on life. Without it, the gas bag is through. END

Survival In the Open

(Continued from page 62)

Roots one to two inches thick from trees growing in hollows between ridges, will contain the most water. As a last resort cut down a young tree at the base, remove the top, invert the trunk, and collect the drippings. In the jungle banana trees, air plants, some bamboo, grapevines, palm trees, and green coconuts can supply water.

Mountain snow can be melted by placing in a shallow container in sunny exposures out of the wind. Other water sources are the gravel bottoms of dry stream beds, springs or spring-fed streams, even when other water courses are frozen. Less fuel is needed to melt fresh ice or granular snow than for new spongy snow, which will also yield less water. In Arctic areas, "old" ice, blue and with rounded margins, will have less salt content than grey milky-looking salt ice. In the tundra, dig a hole to permafrost level and wait for it to fill with water.

At sea, use solar stills as much as possible; save desalting kits for cloudy days. Collect rainwater and dew in and on cloth surfaces, sails, and on the raft surface.

When extremely thirsty, sip slowly in small amounts; when hot from sun or exercise, avoid cold water or excessive amounts of water. If only very cold water, snow, or ice is available, allow it to melt by body heat, not in the mouth or hands, before drinking. Less perspiration is lost, during exertion, if small amounts of water are taken at fairly frequent intervals. Water purification involves use of halazone tablets, boiling for a full five minutes, or addition of three or four drops of iodine to a quart of water with a half-hour wait before use. *Never shortcut water purification procedures.* Water-borne diseases are

among the worst hazards of tropical and sub-tropical countries, particularly in presence of native populations.

Food for survival presents many problems. The all-purpose survival ration has not yet been developed. In general, the best general ration contains about 2,000 calories, with 10 per cent supplied by 35-40 grams of protein, 20-30 per cent supplied by 40-60 grams of fat, and 60-70 per cent supplied by 275-325 grams of sugars and starches. In the tropics, a high-starch sugar diet appears best; in the Arctic and cold climates, fat and protein are needed. For the desert, foods with much water content are desirable; when water is scarce, avoid fat in the diet. At sea and in the desert, if the water ration is between a pint and a quart per day, eat sugars and starches but not meat, fish, fowl, beans and cheese; if the water ration is a pint or less per day, eat nothing.

Many tropical areas offer little food for survival. In others, edible portions of plants include the pods, nuts, stems, root stalks, shoots, bulbs, fruits, seeds, bark, tubers, buds, leaves and sap. Never eat a large quantity of strange food without carefully tasting it. Chew a mouthful of a cooked sample, and hold in the mouth for five minutes: if the taste is or becomes disagreeable, do not eat it. Foods eaten by rodents, monkeys, raccoons, and other vegetable-eating animals are usually safe for humans. The same holds true for foods eaten by birds and mammals, with some exceptions.

In the desert, don't depend on wild plants for food; medium-sized and small game will supply meat which can be preserved by cutting into strips and burying raw and without salt in dry sand six to eight inches below the surface.

Along sea shores and in the open sea, fish and shellfish will supply food. All shellfish with two shells can be eaten; saltwater shellfish can be eaten raw. Kill and eat fish raw within a few minutes of catching; or clean and cut into strips to dry in the sun. Eggs and liver of any fish can be poisonous. Never eat fish with pale slimy gills, sunken eyes, flabby skin and flesh, unpleasant odor, or skin that remains pitted when you dent it. Most poisonous fish are covered with rough or spiny scales, thorn-like spines or long plates, sometimes by soft spines or hair-bristles. They may lack distinct or protruding teeth, and may have an odd box or trunk-like shape to the body.

EVEN the Arctic supplies food from seal, walrus, and abundant fish in shallow seas and at the mouths of rivers. Any near-arctic country not populated by natives is not well supplied with game. Edible plants are rare in arctic regions, but all found north of the tree line can be eaten. Mountainous cold areas are better for game than low-level country. Fruits and berries north of the tree line, usually growing in late summer, are edible. All fruits and berries growing on trees and shrubs in the forested areas are edible, while those of non-woody plants, except the wild strawberry, are not edible. Fungi, such as puffballs, lichens, truffles, and mushrooms, are best avoided; some are safe, many are poisonous, none have much food value. Northern cone-bearing forests are usually poor in game birds.

Next to food and water, medical preventive measures are important—against frostbite, immersion foot, sunburn, insect and water-borne diseases, and for the preservation of physical fitness. Skin infections must be cared for; salt-water boils are best left unopened.

Each type of remote area has special requirements for survival. In desert areas, stay with the aircraft unless human habitation can be seen from the nearest high ground. Never discard clothing; wear it loosely in double layers for efficient cooling with minimum perspiration; protect the head, neck, and eyes from the sun. A cloth mask with eye slits or soot smeared under the eyes can be adequate. In the tropics, use food sparingly; camp away from swamps on high land to avoid insects; use insect netting, mud on exposed skin, full clothing, repellents, and antimalarial tablets. Avoid trees and shrubs with resinous bark.

At sea, drink no water for the first 24 hours; thereafter, if need be, take only 10 to 14 ounces per day until one day's supply remains, thereafter only two ounces per day. Use all possible shelter from wind and spray; minimize exposure to the sun to prevent sunburn, thirst, loss of body water by sweating; protect eyes from glare from sun and water. Don't eat or drink when seasick; lie down and change position of the head. When it rains, drink as much as you can hold. *Never drink body fluids of fish, urine, or salt water.*

Remember that most extremes of cold weather are found not in the Polar basin, but in the subarctic regions. These include 60 per cent of Canada and most of Alaska. Air is coldest at the surface of the snow,

(Continued on page 82)

Keep an eye on AirCoupe

Feature for feature . . . dollar for dollar—you'll find it hard to match the new AIRCOUPE, most advanced model of the famous plane that's been a universal favorite since 1941.

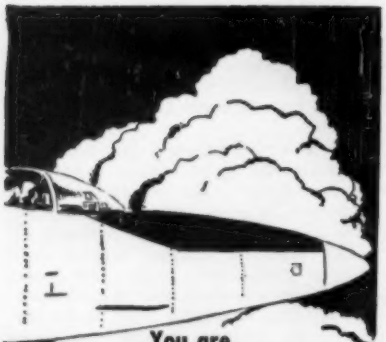
CHECK THESE AIRCOUPE FEATURES:

- QUALITY ALL-METAL CONSTRUCTION
- FAMOUS AIRCOUPE "TWIN-TAIL" STABILITY & MANEUVERABILITY
- CONVENTIONAL DUAL CONTROLS
- 360-DEGREE VISIBILITY WITH AIRCOUPE'S BUBBLE WINDSHIELD AND PLEXIGLASS CANOPY
- LOW INITIAL COST—$7,450.00
- LUXURIOUS INTERIOR APPOINTMENTS
- 3-POSITION ADJUSTABLE CONTOUR SEATS
- 500-MILE RANGE
- UNMATCHED ECONOMY—22 M.P.G.!
- CRUISES AT 125 M.P.H.!

. . . . . and that's not all! You'll find yourself amazed that so much performance, so much quality, so much good looks is now within easy reach of almost anyone who can afford a good car! Yes, it will pay you to keep a sharp eye on AIRCOUPE. Now manufactured in new facilities at CARLSBAD, New Mexico, by a new and quality-minded company.

SEE YOUR NEAREST AUTHORIZED DEALER

AIRCOUPE Division of Air Products Company, Inc.
CARLSBAD MUNICIPAL AIRPORT
CARLSBAD, NEW MEXICO



You are
TOPS in AVIATION
when you get your EDUCATION at
PARKS
COLLEGE OF SAINT LOUIS UNIVERSITY

There's a future waiting for you when you choose Aviation as a career . . . and being a PARKSMAN adds to your prestige.

PARKS offers to you the advantage of a Bachelor of Science degree in 3 years instead of 4 . . . and there is no elimination of subjects. Classes are held for 45 weeks out of the year. Such an accelerated program permits PARKSMEN to start their careers nearly 1 year sooner.

You may earn a B.S. Degree in:
Aeronautical Engineering
You may earn a B.S. Degree in Aeronautics
Aeronautical Administration
Aeronautical Meteorology
Aircraft Maintenance Engineering

(Air Force ROTC allows you to complete your education without interruption.)

Non-degree courses available — FAA Approved, A & E Mechanics — 45 weeks covering all phases of aircraft and engines.

Flight courses—Private, Commercial, Instrument, Instructor and Multi-engine Ratings.

All Parks Schooling is Approved for Veterans. Remember too, the PARKS faculty combines the talents of men holding advanced academic degrees as well as experts from the aviation industry.

PARKS offers only the most superior training and because this is a fact . . . enjoys an enviable reputation around the world!

33 YEARS OF AVIATION EDUCATION

GET THIS BOOK
Page after page of pictures describe how PARKS students live and learn.
MAIL THE COUPON NOW!

PARKS COLLEGE, HARPER HALL
East St. Louis, Ill., Dept. 3011
Please send View Book
I am interested in:
- ☐ Aeronautical Administration
- ☐ Aeronautical Engineering
- ☐ Aircraft Maintenance Engineering
- ☐ Aeronautical Meteorology
- ☐ Flight Course
- ☐ A & E Course
- ☐ G.I. Training Information

Name .....Age .....

Address .....Zone .....

City .....State .....

(Continued from page 81)

especially in local surface depressions, and often very much warmer two feet below the surface or 100 to 500 feet up on hillsides. Survival by fishing is easier than by hunting. To survive for long periods, the hunter must obtain 40 to 50 pounds of meat per rifle shell.

Needless to say, in any region the proper use of signaling devices is vital to assist prompt rescue.

The will to survive is a necessity. Without any knowledge of survival technique, a man stranded on a vast stretch of Arizona desert for eight days without food or water traveled 150 miles in daytime temperatures as high as 120 degrees; loss of water decreased his weight by 25 per cent, where a 10 per cent loss is often fatal. He crawled the last eight miles completely naked; the many cuts on his body did not bleed because his blood was too thick from water loss. He had done nothing right, yet he was determined to survive and he did. Few could imitate his example; none would wish to do so. The attitude that "It can't happen to me" is unrealistic and dangerous, and interferes with the thorough preparation that survival in the open demands. The present article is intended to stimulate an interest in the subject for the pliot, but cannot begin to cover all important aspects. As always, the best prepared pilot has the best chance to survive. END

Piper Colt

(Continued from page 49)

maneuvering presents no problem at all.

Power is furnished by the very reliable Lycoming O-235-C1B four-cylinder engine producing 108 hp at 2,600 rpm. One hundred and fifteen horsepower would be available for takeoff if 2,800 rpm could be attained. In the evaluation airplane, however, 2,400 rpm was the maximum recorded, and we did not attain even 2,600 until over the 100-mph mark. So actually less than the 108 hp was used for takeoff. A metal 74-inch Sensenich propeller is provided on all models.

A single 18-gallon tank mounted in the left wing is the total fuel on the standard airplane, but a second tank of equal capacity, mounted in the right wing, is available on all models for an additional $200 and 20 pounds in weight. This gives the plane a total of six hours' range and it seems to the writer a necessary extra regardless of the use intended for the airplane. Electric fuel gages are provided, and fuel flow is by gravity.

With Paul Neff, a northeastern Piper distributor, myself, a full fuel load and miscellaneous survival equipment on board, the weight of N 4502Z was 1,504 pounds at the start of the evaluation. This is approximately 150 pounds below normal gross but is the weight at which the Colt normally will be flown. Sea level pressure during the evaluation was 29.96, temperature 83 degrees F and the wind was south at 15 knots.

The Lycoming started easily and idled smoothly and quietly at 500 rpm. The landing gear is fairly firm, but the ride, even over the uneven surface at the West End Airport in the Bahamas was very good. In taxiing, the plane tends to rock somewhat on the closely placed wheels.

Mags were checked at 1,800 rpm and the trim set for takeoff; there was so little to do that we seemed to be forgetting something. With tower clearance and a 40-degree crosswind, takeoff was started. The nose was raised at 45 mph and the Colt became airborne at 65 mph without skipping after a run of less than 600 feet.

The weather was squally, a warm front lay to our South and several water spouts had been reported in the general area. The ceiling was between 2,000 and 2,500 feet but turbulence was light. The Colt offered no trouble in trimming hands off, and stability was very good. A level cruise was established at 1,500 feet with 2,400 rpm. An indicated airspeed of 105 mph resulted, which trued out to a solid 110 mph. We tried a top-speed run, and ended up indicating 115 mph at 2,600 rpm with approximately three-quarters' throttle. This trued out to 121 mph, and it seems that some sort of a controllable or constant speed propeller would do wonders for this airplane. There are no provisions for such a propeller.

The noise level in the cabin in flight was comfortable and it is unnecessary to raise the voice while talking.

PIPER COLT 108

Specifications:	
Power: Lycoming O-235-C1B rated (2,600 rpm) at	108 hp
Gross weight	1,650 lbs.
Empty weight (standard)	940 lbs.
Useful load (standard)	710 lbs.
Wingspan	30 ft.
Wing area	147 sq. ft.
Length	20 ft.
Height	6.25 ft.
Fuel capacity (standard)	18 gals.
Fuel capacity (optional)	36 gals.
Performance (full gross weight of 1,650 lbs.):	
Top speed	120 mph
Cruising speed (75% power, sea level)	108 mph
Optimum cruising speed (75% power, 7,000 ft.)	115 mph
Stalling speed	54 mph
Takeoff run	950 ft.
Takeoff over a 50 ft. barrier	1,500 ft.
Landing roll	500 ft.
Landing distance over a 50 ft. barrier	1,250 ft.
Best rate of climb speed	75 mph
Rate of climb (sea level)	610 fpm
Service ceiling	12,000 ft.
Cruising range (standard fuel, 75% power, sea level)	324 mi.
Cruising range (optional fuel, 75% power, sea level)	648 mi.
Cruising range (optional fuel, 75% power, 7,000 ft.)	690 mi.

It was apparent that there was no interconnection of the controls on this airplane; it has a solid feeling. The controls are very light, and the Colt responds to the slightest movement. It is very pleasant to fly.

Putting the Colt into a full-power, rudder exercise stall resulted in considerable wing wagging, but aileron control could be maintained. Indicated stall speed at full power was 40 mph. By pulling the nose up beyond a 45-degree angle the airspeed

would drop to about 35 mph before the nose fell through. Power-off stalls are gentle; the plane oscillates until a stabilized speed of 50 mph is reached, and this attitude is maintained with the wheel full back at a steady 600 fpm rate of descent.

Slow flight could be maintained at 42 mph indicated with 2,000 rpm; this same rpm resulted in an indicated 85 mph in full flight. As no vertical speed indicator was installed, it was necessary to time all climbs and descents. At 75 mph, best climb speed, a 750 fpm climb was attained at full throttle.

Steep turns of near 60 degrees could be accomplished with little loss in airspeed at cruise power. The usual loss would be about five mph and it was a simple problem to maintain altitude.

The weather was turning sour so we returned to the field to shoot some landings. The wind was still 15 knots and 40 degrees to the only runway, but the Colt negotiated it without difficulty using a straight wing-low procedure. On final approach 80 mph indicated felt very good and allowed for nice flare to touchdown; lesser airspeeds seemed somewhat loggy and resulted in a much greater rate of sink. At 70-75 mph on final, touchdown was immediate after the flare, and there was no float at all. The final landing was made from a nose-high slip at an indicated 70-75 mph. The vertical speed was quite high, and recovery was initiated at about 50 feet above the ground, but even so the sink rate was still so high that power had to be added to cushion the touchdown.

The Colt is a very easy airplane to fly. It seems to be a mistake to try to land it. Far better results seem to be achieved by just driving it in. It does not have all the low-speed forgiving nature of the old J-3 but it is simpler to fly; it is less affected by winds, and once on the ground is reasonably content to stay there. This was not always the case with a lightly loaded J-3 in high winds. The tricycle landing gear with its reduced ground angle of attack gives far better ground handling than possible with the conventional gear. It provides the natural step toward the higher performance aircraft.

PIPER has a finance plan which will permit the purchase of the standard Colt for as little as $995 down and $29.68 per week for three years. By using a club plan, five members could put $200 down each and cover all fixed costs including payment, insurance and hangar (in most localities) for as little as $10 each per week.

The Colt was placed on the market to fill the need for a low-cost training airplane with sufficient performance to satisfy private ownership and to provide reasonable cross-country capability. With the dual fuel tanks, it meets these requirements very well. Certainly it is not lacking in baggage space. The area behind the seat is enormous and is placarded at 100 pounds.

The choice between the three models would be to the purchaser's requirements. The standard with one tank would suffice for airport flying while the Super Custom provides an inexpensive instrument trainer fully capable of qualifying pilots for FAA ratings. END

HEAR AIRCRAFT

HEAR AIRCRAFT
IN YOUR HOME, OFFICE, HANGAR

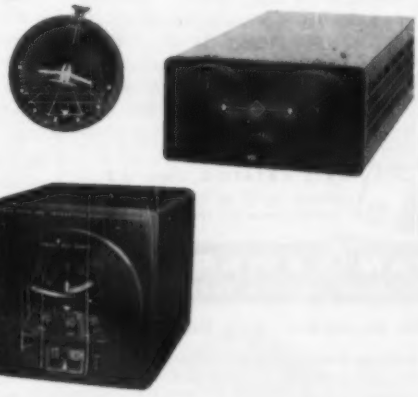
Listen to planes in flight, control towers, weather, emergencies, plane-to-plane conversations, IFR instructions, plus official weather forecasts. Plugs into any wall socket. You can tune any frequency from 108 to 130 MC. HEAR WHAT PILOTS SAY. Sharpen up your VHF radio techniques by listening to IFR approaches, ATC clearances, and tower transmissions.

AIR-O-EAR has heavy duty 6" speaker, headset jack with automatic speaker cut-out. **AIR-O-EAR HAS THREE BANDS** . . . Aircraft, weather and standard broadcast band . . . enjoyment for the whole family. Powerful 7 tube circuit delivers full rich Hi-Fi sound. Slide rule tuning allows accurate calibration . . . panel light . . . built-in antennas . . . handsome decorator cabinet. Accurate weather information on LF band tunes 200 to 400 KC. **AIR-O-EAR** has squelch control. **TRIED AND PROVEN** . . . more than 6,000 now in use by pilots, executives, airlines, government and industry. **AIR-O-EAR** is 12"x6"x6" and weighs 7 lbs.

AIR-O-EAR AIRCRAFT RECEIVER . . . $99.95

Iron Clad Money Back Guarantee
NOVA-TECH, INC.
1721 Sepulveda Blvd., Manhattan Beach, Calif.
Please send me my Air-O-Ear Receiver at $99.95
☐ I enclose $..... ☐ Send COD ☐ Budget Terms,
I enclose $45.00 ☐ Send complete Free Information
NAME .....
ADDRESS .....
CITY, STATE.....

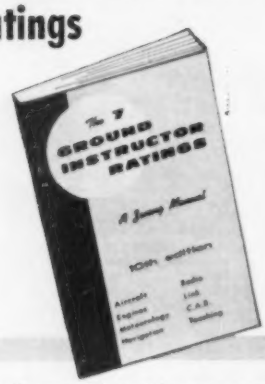
Bank rates available for purchase of new or used aircraft; for new equipment including installation. Now, individuals or business firms can purchase aviation equipment for the first time or for replacement of present aircraft equipment. The Clayton Bank, aircraft loan department, is offering bank rate financing for your flying requirements. If you desire to add electronic equipment, the Clayton Bank will finance the equipment and installation costs. Up to $100,000 is available to firms or individuals purchasing and flying in the continental 48 states. For further information write to Mr. Jess Hinton giving complete details of equipment or aircraft desired including flight time, unit identification number, model, flight hours since over-haul, etc., or telephone PArkview 6-5566.



FINANCING by CLAYTON BANK

7820 Bonhomme Avenue, St. Louis (Clayton 5), Missouri

Choose Your Career 7 FAA Ground Instructor Ratings



Indispensable guide to a career as FAA ground instructor in aircraft, engines, meteorology, navigation, radio, Link trainer, or Civil Air Regulations. Completely new 1961 Tenth Edition!

☐ GROUND INSTRUCTOR RATINGS
Typical examinations and answers on all 7 ratings. Text and questions on Teaching Fundamentals. Study guide. 225 pages—$5.00

Other Current Zweng Manuals

- ☐ PRIVATE PILOT RATING—$4.95
- ☐ COMMERCIAL PILOT RATING—$4.00
- ☐ INSTRUMENT RATING—$5.00
- ☐ AIRLINE TRANSPORT RATING—$5.50
- ☐ A & E MECHANICS' RATING—$5.00
- ☐ FLIGHT ENGINEERS MANUAL—$5.00
- ☐ HELICOPTER PILOT RATING—$5.00
- ☐ FLYING THE OMNIRANGE—$4.00
- ☐ RULES OF THE AIR—$2.00
- ☐ SAFETY AFTER SOLO—$4.75
- ☐ E-6B COMPUTER MANUAL—$3.00
- ☐ TOWER & DISPATCHER—$5.00
- ☐ AMERICAN FLIGHT NAVIGATOR—$6.50

FREE CATALOG, new, 52 pages; 1,000 aviation books; navigation aids, charts & logs.

PAN AMERICAN NAVIGATION SERVICE

12021 Ventura Blvd., North Hollywood, Calif.

☐ Send me free copy of your new catalog.
☐ Payment enclosed ☐ Send C.O.D.
(In Calif. add 4% sales tax)

Name _____

Address _____

City & State _____ F-1

Brantly B-2

(Continued from page 53)

synthetic rubber disk, which limits its travel, are kept extended in flight by the weight of the skids. A flapper valve closes during compression of the oleo on contact with the ground and a conventional metering pin creates a cushioning which softens even the most difficult landings.

Hover work including turns-on-a-spot and sideward and rearward flight were all very routine with more than enough power and control travel available. Stability was very evident, allowing a minimum of control movement once in an established condition.

On a fair day, as this was, the sun can create a heat problem in the cabin. A fan or some other cooling device is a comfort feature that should be incorporated as standard equipment.

The final portion of the evaluation was involved with emergencies in the form of simulated engine failures, or autorotations.

On takeoff, autorotation was induced at an altitude of 30 feet and an airspeed of 45 mph. A steep flare was initiated to dissipate the forward speed and then the aircraft was leveled immediately while cushioning collective was applied fully. (Although the skids will allow the ground run on autorotations to be accomplished over smooth terrain at speeds in excess of 50 mph, operational conditions for purposes of the evaluation were imposed whenever possible.)

Autorotations from cruise require an adjustment of airspeed to 55 mph to obtain the minimum rate of descent. Even though the rate of descent was estimated at a relatively high 1,600 fpm, the controllability plus the oleo skid gear create a wide margin of safety for even those with limited helicopter experience.

The low-pitch stop for the main rotor has been set to obtain 500 rpm at maximum gross weight. From 70 feet down the cyclic is handled as in powered flight for the execution of the flares. With a level altitude and a forward speed of 25 mph, rotor rpm is more than ample to reduce the rate of descent with collective pitch to a leisurely one-foot-per-minute at contact.

Over rough terrain an abrupt flare must be executed to dissipate forward speed to allow the B-2 to settle vertically. This type of landing requires greater pilot skill as the rate of rotor decay is increased as airspeed is decreased.

In autorotation from a hover, full right rudder must be applied with collective to prevent the helicopter from turning as it settles to the ground. While the B-2 requires a good deal of right rudder in all engine-loss cases, the speed in application of this pressure is always more critical close to the ground.

The B-2 is unique in one respect from any other skid gear helicopter in that the collective is lowered fully once ground contact is made. The action of the oleos builds in a cushioning effect which other skid types must accomplish through collective manipulation.

In taking a look at some of the engineering features which contribute greatly to the B-2's controllability in flight, the key to stability lies in Brantly's main rotor design.

Differing from other rotor blades, those on the B-2 have, in addition to conventional flapping hinges and pitch-change bearings at the rotor head, extra flapping hinges and lag hinges located approximately halfway down the blade length. These mid-hinges permit freedom of blade motion to experience all of the aerodynamic forces of lift and drag, thus offering a more responsive rotor wing which also keeps the blades in phase at higher cruising speeds.

The additional hinges also eliminate the need for an expensive servo system to dampen out feedback by having the forces counteract themselves in the rotor system without being introduced into the drive system, controls, or fuselage.

BRANTLY B-2

Specifications:

Empty weight	980 lbs.
Useful load	620 lbs.
Gross weight	1,600 lbs.
Fuel capacity	186 lbs. (31 gals.)

Dimensions:

Length (overall)	21 ft. 9.1 in.
Height	6 ft. 11.75 in.
Width (cabin section)	3 ft. 11 in.
Skid (gear tread)	5 ft. 8.25 in.
Main rotor diameter	23 ft. 8.89 in.
Tail rotor diameter	4 ft. 3 in.

Performance:

Rate of climb at sea level	1,507 fpm
Rate of descent at sea level	1,400 fpm (55 mph)
Speed	100 mph
Range	300 miles (plus reserve)
Service ceiling	9,300 ft.
Hovering ceiling	5,000 ft. (standard day)
Absolute ceiling	10,300 ft.

Blade life is currently set at 2,500 hours. And Brantly is actively engaged in introducing a new rotor design, aimed at prolonging the life of the blade while making it simpler and safer.

Another break-away from the conventional can be noted in the B-2's cooling system, which does not employ the common belt-driven fan. Brantly utilizes exhaust gases from the engine to create a pressure drop in the exhaust manifolds, or inductors, which draws cooling air through passages formed by cylinder-head baffles.

Cooling air enters the engine compartment via air scoops located near the top of the engine compartment on each side of the fuselage. Maintenance is relatively simple and accessibility to B-2 components is not difficult.

The 180-hp Lycoming engine has its overhaul life set at 600 hours. That of the airframe is 1,200 hours. Fuel consumption at 90 mph is 8.5 gallons per hour for a range of about 300 miles.

Presently there are 27 B-2 distributors covering the continental United States,

with nine foreign distributors opening up shop for international sales.

Brantly does not plan on making its helicopter operation a one-shot proposition. On the drawing board is a six-place, tandem design incorporating two rotors. Each of the dual powerplants will be of higher horsepower than the present engine, for good single-engine performance. Cost will approximate $39,000.

In speaking with Peter K. Pascal, who has spent the past several years studying every phase of helicopter growth, it was apparent that the industry is beginning to gear itself toward the private operator who can fly his own aircraft with a good margin of safety.

The Brantly B-2, through a favorable combination of performance and economy, offers a marketable product of vast potential to this area of aviation. END

Sperry

(Continued from page 48)

his manufacturing techniques became vastly meaningful to the stream of history.

We could go on and on citing from the lives of the great servant peerage—Boone, the trail blazer; Noah Webster of dictionary fame; Audubon, the ornithologist; Burbank, the horticulturist; Theodore Roosevelt, the conservationist; William Booth, the humanist; Graham Bell, Igor Sikorsky, Glenn Curtiss, John D. Rockefeller, and a score of moderns . . . but our intention is not to author a "Who's Who" of service. It is to make clear the point that the destiny of the U.S. was forged by smithies who were motivated by a concept of responsibility to their times and to show that the place of Elmer Sperry among such men is no mere rhetorical evaluation.

Mr. Sperry was born October 12, 1860 in Cortland, N. Y., adjacent to the lovely finger-lake country.

He perhaps inherited some characteristics of mind from his mother, who was a notable mathematician. She died at Elmer's birth and he was raised by an aunt of staunch character. The boy's father was an executive of Cortland's main industry, a wagon manufacturing corporation. The lad may have had from his father some inheritance of mechanical aptitude. As a growing boy, he was intimately familiar with the mechanics of vehicles.

He also worked in a printing establishment and may have gained some insight from that exposure.

Two other contributing influences helped to shape his interests. One was the presence of a state institute in Cortland which provided exploratory opportunity in electricity, a little known but promising scientific field. The other influence was the local YMCA which boasted a reading room with magazine subscriptions to technical and scientific journals of the times. Additional to common school, these constituted almost the only source of formal education for Elmer Sperry.

While a student at the Cortland Institute, he heard through his teachers about a trio of professors at Cornell University, only some 20 miles away, who were building a machine which they called a dynamo.

(Continued on page 86)

McCAULEY MET-L-MATIC POWER

THE FINEST IN FLIGHT

The McCauley Met-L-Matic provides airliner efficiency and performance for the newest and finest of light planes: the Bellanca 260, the Cessna 210, the Mooney Mark 20A, the Navion, and the Piper Comanches, all shown above.

Finest available constant speed propeller for business and private aircraft.

- Completely enclosed pitch changing mechanism
- Pre-lubricated blade-bearing assembly
- Retention-bearing ball separators that virtually eliminate maintenance
- Large diameter ball thrust retention bearing minimizes friction
- Static and aerodynamic balance held to exceptionally close limits.

See for yourself why an ever-increasing number of pilots and aircraft manufacturers agree

fly the finest...fly McCAULEY

McCAULEY INDUSTRIAL CORPORATION
1840 Howell Ave., Dayton 17, Ohio

More personal and business aircraft are equipped with McCauley propellers than any other kind.

Jets Are Here!

Be a JET MECHANIC in 10 Months!

...with FAA Power Plant Certificate!

Send immediately for Full Details of Spartan's Short Term Course.

- Extended Payment Plan
- Free Lifetime Placement

Spartan School of Aeronautics
Municipal Airport • Tulsa, Okla.

WHICH CAREER INTERESTS YOU

- ☐ Jet Mechanic
- ☐ Avionics
- ☐ Co-Pilot Engineer
- ☐ Commercial Pilot
- ☐ Link Trainer
- ☐ Instrument Mechanic
- ☐ Airplane & Power Plant Mechanic

F-1-1

Director of Admissions
Spartan School of Aeronautics
Municipal Airport • Tulsa, Okla.

Name.....

Address.....

City.....Age.....

Zone.....State.....

We would be pleased to receive a letter from you giving us your ideas and plans concerning your future.

(Continued from page 85)

It was the first such to be attempted in America and it fired the boy's imagination. He drove horse and buggy to Ithaca and volunteered to be a helper of those working on the concept. They had to draw their own wire and wrap it with insulation of silk rags. In all such chores a helping and understanding hand was welcome. Eventually, the dynamo was completed and placed as a phenomenal exhibit in the great Philadelphia Scientific Exposition, celebrating 100 years of American industrial progress. Sperry's father had died and the boy had no funds with which to travel, but the YMCA took up contributions and Elmer was sent to Philadelphia along with the dynamo. Here he was brought in contact with the entire range of the mechanical and electrical contrivances of the world and apparently he digested the whole of it. It was worth a college education, or so he reported.

In 1880, the orphaned boy, now 19, left his native town for Chicago, his sole fortune and baggage the arc lights and generators he had built. His father had told him that Chicago was the center of American opportunity. He knew no one there but had a letter of reference from his church to a Baptist deacon in the "windy city."

Nor did the lad need reference beyond his own initiative. On his 20th birthday he opened shop in a rented building on West Quincy Street under the title, The Sperry Electric Illuminating and Power Company. His first contract came swiftly—installation of 20 lights on the Cook County building with wires strung from a dynamo in the basement.

Shortly, he built a central power station, furnishing light to such as The Chicago Tribune and numerous other great and small corporations and stores. Atop the Board of Trade tower, visible from all over the city, he installed lighting of more than 40,000 candlepower. Soon, he was installing central lighting throughout the mid-west, at Omaha, Kansas City, and St. Louis.

He lighted the annual Inter-State Chicago Exposition and, as his company grew, so did his scientific stature. By 1892, in universal competition, he was awarded the contract to illuminate the World Columbian Exposition.

NOW came a move which was characteristic of Mr. Sperry's career. He sold his interests in order to move on to and finance other fields of usefulness. A part of those interests went to become the foundation of Commonwealth Edison of Chicago. His arc-light patents he sold to General Edison of Schenectady, which was later combined with the Thompson-Houston Company to form General Electric.

In the meantime, the young man had visited an Illinois coal mine and observed the low rate of production. To him this was intolerable, so he invented an electric drill and chain cutter to replace the miner's pick and an electric car to replace the mules underground. This led to formation of The Sperry Electric Machinery Mining Company and to it went the first bulk order for electric equipment in mining history.

Next, with his brother-in-law Herbert Goodman, and Frank Washburn, he went into business as The Goodman Manufacturing Company. The company imported an electrolic process from Germany and established a subsidiary plant at Niagara Falls. Sperry was the electrical engineer. This was the origin of the American Cyanamid Company.

In 1889, Arthur Dana, Sperry's best friend, organized the Chicago Fuse Wire and Manufacturing Company around one of Elmer's patents. He also founded the Appleton Electric Company around Sperry's patents in small motors and accessories. Eventually, as he almost always did, Mr. Sperry sold his interests in these corporations.

DUE to experience in building the electric mine locomotive, he was sought by electric streetcar railway financiers who had found operating problems in hilly country. Among these was Myron Herrick, ambassador to France at the time of the Lindbergh flight. Sperry knew the answer and, moving to Cleveland, O., founded with his backers, The Sperry Electric Railway Company. As if this were not enough, he simultaneously invented an electric automobile which was produced by the Cleveland Machine Screw Company. It had the first four-wheel brakes and many innovations far ahead of its time. In it Sperry took John D. Rockefeller for his first automobile ride.

The streetcar development proved a great success. Once again General Electric bought a Sperry-founded company and its patents. The foreign manufacturing rights of the Sperry automobile were sold in France and the American rights were disposed of to the American Bicycle Company. They marketed the vehicle as the Waverly Electric.

The decisive factor in the success of the electric automobile had been its heavy-duty battery. This battery trebled the performance of anything in existence. Now the National Battery Company of Cleveland was formed to manufacture and market similar units. Sperry was the company's chief engineer. In 1901 its plant was moved to Buffalo and purchased by a railway lighting car corporation in which Walter Chrysler and John Willys were active. When they turned to automotive manufacture, the battery company was merged with Electric Auto-Lite Corporation.

How Elmer Sperry thus was led into the field of electro-chemistry and became a contributing genius in such vast corporations as Hooker Electrochemical, American Can and Anaconda Copper is apparent.

But we shall follow his manifold interests no further in fields scantly related to aviation. We merely wished to establish evidence to support our judgment that Elmer Ambrose Sperry, to whom flight owes so much, was one of the most useful men in American history and ranks with the peers of this great fraternity, from Franklin to the Wrights.

In a subsequent article we will treat with Sperry's insight into the need for some great principle to expand the usefulness of sea and air logistics and mark how his genius met the call of national destiny. It's a part of the airman's heritage. END

Leading Ladies

(Continued from page 55)

resumed her flying career.

A good friend and flying comrade of Katherine Stinson's was Ruth Law, who specialized in long-distance and stunt flying.

Her most notable achievement in this field was an eight-hour, 55-minute flight from New York to Chicago in 1918.

But even before the turn of the century women were proving that men had no exclusive title to air-age achievements.

Madame Thibaud was the first heroine of the sky. She made numerous balloon ascents over Paris in 1789. It was also a French woman, Mme. Therese Peltier, who was the first of her sex to make a flight in a heavier-than-air machine. That was in July, 1908.

A year later, the Baroness de la Roche, another French woman, became the first woman airplane pilot. A long list of fellow-countrywomen followed in her footsteps. Among them was Mlle. Helene Dutrieu, the daughter of a French army officer and the only woman pilot registered at the first great international air meet, the historic gathering at Belmont Park on Long Island in October, 1910.

But it was the years between World Wars I and II that brought into the world news in so spectacular a fashion a long list of outstanding women aviators, such as: Amelia Earhart, Ruth Nichols, Phoebe Omlie, Blanche Noyes, Jacqueline Cochran, Laura Ingalls, Gladys O'Donnell, Elinor Smith, Louise Thaden, Evelyn "Bobby" Trout, Helen Richey, Dorothy Hester, Teddy Kenyon, Viola Gentry, Ruth Elder, Betty Gillies, Frances Marselis, Maud Tait—all American. France's Maryse Hilsz and Helene Boucher; England's Lady Mary Heath, Lady Mary Bailey, Winifred Spooner, Amy Johnson (Mollison); Germany's Thea Rasch, "Tony" Strassman, Hanna Reitsch; New Zealand's Jean Batten; Katya Mednikova and Valentina Grizodubova, of Russia.

In the immediate post-WW I period Phoebe Fairgrave Omlie, who soloed in 1921, made her early specialty non-piloting stunts. She set a world's record for parachute jumping, leaping from 15,000 feet at St. Paul, Minn. She walked wings and hopped from the wing of one plane to another in flight.

Later she and her husband, ex-Army pilot and Curtiss instructor, Capt. Vernon Omlie, set up a Mississippi flying school, and in 1927 she became the first woman to earn a U. S. Department of Commerce transport pilot's license.

In 1929, while assistant to the president of Mono Aircraft (predecessor to Monocoupe), she set a 25,400-foot altitude record for women at Moline, Ill., and then won the 1930 Dixie Derby. During the '30s she served on a special committee on aeronautics, and as a private-flying specialist for the Civil Aeronautics Authority.

Ruth Nichols, daughter of a well-to-do suburban New York family, discovered the thrill of flying in 1919 when, on vacation with her family in Atlantic City, N. J., her father treated her to a 10-minute (for $10) ride with famed Eddie Stinson in his wood-

(Continued on page 88)

Solong, JET AGE JOE

(PODDY PARISH, VETERAN BUSINESS PILOT)

Hello, JET AGE JANE
(KAY SUTTON, 19, QUEEN OF THE DALLAS TEXANS PRO FOOTBALL TEAM)
We may see you again in the New Year, Kay . . . That is, if readers WANT you back with 11 of your beauteous friends, one-per-month in '61.
For 4 years, folks have been fussing and fuming because we discontinued our famous "pretty girl" ads.
Kay, let's see if they're serious!
READERS: CALL, WRITE, WIRE — TODAY!
IF YOU'RE CONVINCING, WE MAY RESPOND IN '61 WITH A DOZEN DAZZLING JET AGE JANES.
WE'RE LOOKING AND LISTENING!

Southwest Airmotive Co., Dallas

AIRPLANES ● ENGINES ● SERVICE ● SUPPLY

Parts Outlets: Denver, Houston, Kansas City, St. Louis

1" with Jets

FEDERAL
world famous AIRCRAFT SKIS

- Skis raised or lowered hydraulically while in flight or on the ground.
- Tires rest on ski board absorbing shock of landing or take-off runs.
- Models specifically designed for all popular makes of aircraft adaptable to skis.
- Manually operated and wheel replacement models also available at a saving.

Profitable, safe flying the year around!

Your plane, equipped with modern, dependable FEDERAL skis, can be flown anywhere, anytime in complete safety. Every snow covered field or lake becomes a convenient landing strip. You'll double the use of your plane in the North country . . . for business, sports, or pleasure flying. FEDERAL skis are known and used the world over. Dependability backed by more than 35 years experience in military and civilian use.

SEND FOR FREE BROCHURE

FEDERAL SKI & ENGINEERING

3456 No. Washington • Minneapolis, Minn.

LOOK AHEAD!

© 1960 UPA PICTURES, INC.

Mr. Magoo says you can't afford to be near-sighted about cancer. Too dangerous. Too much to lose. Maybe your life.

Got to look ahead. Play it safe. Many cancers can be cured if detected early and treated promptly.

Be far-sighted. Have a health checkup every year. It could save your life.

AMERICAN CANCER SOCIETY

PILOTS FLYING GLOVES $4.95 per pair

Worn by more pilots throughout the world than any other glove. Same glove presently being issued to U. S. MILITARY PILOTS.

Lightweight kid-skin leather. Form fitted for that "bare hand feel." Sizes 8, 9, 10, and 11. Available in Dark Brown, Black, or Creme. With or without military insignia.

—Send $1.00 with C.O.D.'s—

PILOTS SUPPLY COMPANY

P. O. Box 606 Springfield, Virginia

DEALERS AND FLYING CLUBS WRITE FOR RATES

NEW Bensen Gyro-Copter

The World-famous "Spirit of Kitty Hawk" now available in plans and kits. Can be easily built and flown by do-it-yourself hobbyist. Three-view drawings of the craft may be purchased for $2. or simpler Copter-Glider $1. Send your order now. Use coupon below.

BENSEN AIRCRAFT CORP., Dept. F-11
Raleigh-Durham Airport, Raleigh, N.C.

Name .....

Address .....

(Continued from page 87)

and-baling-wire plane.

She soloed in 1923, earned FAI hydroplane certificate 800 in 1924 and, in 1929, became the second woman certified as a transport pilot. Until her death in 1960, she held a commercial single and multi-engine license with an instructor's rating. In 1958 Ruth became the first woman to fly in a supersonic TF-102A above 50,000 feet, with USAF Col. Fred G. Hook. In 1959, she underwent a preliminary sample of the space test which Jerrie Cobb later completed in its entirety.

In those early days when cross-country flying was a feat, Ruth established many records and ranked as one of the finest flyers of the day. She was the first woman to land an airplane in all of the then 48 states. She flew in the first Women's Transcontinental "Powder Puff" Derby; and was the first woman to make a one-stop coast-to-coast flight. She bettered a previous record established by Lindbergh, in the process,

In 1931 she received the Harmon National Trophy as holder, simultaneously, of three international records for altitude, speed and distance. That same year she attempted to fly the Atlantic, but crashed in Newfoundland, injuring her back.

Louise McPhetridge Thaden was a sophomore at a college in Wichita, Kan. when bitten by the flying bug. She got a job with Travelair, then located in Wichita, and took part of her pay in flying lessons. By 1927 she had her license.

IN THE late '20s and '30s, Louise set altitude, speed and flight endurance records. One flight, with the late Frances Marselis, lasted a grueling 196 hours in the air in 1932. This topped the record of 17 hours and five minutes set by California's Evelyn (Bobby) Trout in 1929, and that of New York's teen-age pilot, Elinor Smith, of 26 hours and 21 minutes, that same year. In 1936 Louise, with Blanche Noyes, marked up her most outstanding feat, setting another first for women pilots by winning the Bendix Transcontinental Trophy Race in 14 hours, 55 minutes. Now a lieutenant colonel in the Civil Air Patrol, Louise flies mostly for pleasure.

All throughout this between-the-wars period women kept on making aviation headlines. Blanche Noyes, for example, got the late John D. Rockefeller Sr. into an airplane for the first time and was rewarded with a shiny new dime. Taught to fly by her airmail-pilot husband, Dewey, she received her license in 1929, and now has better than 13,000 hours flying time. She still adds hours as chief of FAA's Air Marking staff.

She likes to recall her participation in the thrill-packed first women's air derby, the 1929 race from Santa Monica, Calif. to the Air Races in Cleveland. Blanche's plane caught fire over the desert and she was forced to land. In taking off over the mesquite she damaged the landing gear and had to make a forced landing in Texas. Making repairs herself, she continued on to Cleveland and finished in fourth place. It was at this time that she began a long friendship with Amelia Earhart.

Amelia was a high-spirited and kindly girl who expertly made a place for herself in a man's world. She was born in Atchison, Kan. on July 24, 1898. She became a nurse's aid in a Canadian military hospital in World War I, studied medicine at Columbia University and later did social work in New England. In addition, she worked as an office clerk for the telephone company in Los Angeles. There she learned to fly in 1921, receiving her early instruction from another woman pilot, Neta Snook. Miss Earhart soloed in 1922, and received her FAI license in 1923.

FROM the first, Amelia made history. Crossing the Atlantic in June, 1928, as the first woman passenger, she flew with pilot Wilmer Stultz and mechanic Lou Gordon in the Fokker "Friendship." Three years later she married George Palmer Putnam, a New York publisher who was one of the flight's sponsors.

On May 21, 1932, she flew the Atlantic alone, making the trip in 13 hours, 30 minutes in a single-engine Lockheed Vega. For this she was awarded the Distinguished Flying Cross by Congress. Now badly bitten by the long-distance, ocean-hopping bug, Amelia flew from Honolulu to California, 2,400 miles nonstop, to become first person ever to make this flight solo. Later she became the first to fly nonstop from Mexico City to New York, a distance of 2,125 miles. She followed this with a try at an around-the-world trip with Captain Harry Manning, a skipper of the United States Lines, as navigator, and Fred Noonan as copilot.

Amelia planned to follow the equator, traveling in the same direction as the sun. She made it to Honolulu, but cracked up on takeoff for Howland Island. Back home, her plane repaired, she decided to try again, this time in the opposite direction from the East Coast. Captain Manning had returned to sea, but Fred Noonan was still with her.

They took off in May, 1937, from Miami, island-hopped down through the Caribbean and on to Natal, Brazil, then across the South Atlantic to Dakar, French West Africa. Over Central Africa she flew to the Sudan and across the Nile, to the Red Sea and Arabia, to India, Singapore, Java, Australia. A month after leaving Miami, she reached Lae, on the edge of New Guinea's jungles, the last stop before taking off for Howland Island. Somewhere on this leg of the flight they disappeared.

In living memory of Miss Earhart, two scholarships, one by Zonta International and one by the Ninety-Nines International Organization of Licensed Women Pilots, are granted each year. Zonta's award is to women engineers for graduate work in aeronautical engineering. The Ninety-Nines' award goes to a selected member to further her flying skills. Amelia, one of the original members of the Ninety-Nines, served as the organization's first president.

The last third of the 20th century holds the promise of dreams yet to come—airliners flying at twice-the-speed-of-sound, manned space flight, nuclear-powered aircraft.

Looking to this revolutionary future are today's women in aviation. As in other fields of development, they will play an increasingly important role, never satisfied with yesteryear's achievements, but striving always for tomorrow's improvements. END

Northernmost Airline

(Continued from page 59)

of 20,000 nomadic Lapps and their reindeer, a people still living by a culture at least twice the age of western civilization. From Alta the route swings sharply south to Tromso, center for Arctic whaling and sealing expeditions, and then divides into three lines near its southern extremity.

The first route from Tromso goes directly to Bardufoss, one of the two northern terminals for SAS multi-engined traffic in Norway. The second proceeds to the large town of Harstad, through the fishing communities of Svolaer and Gravdal, past the Lofoten Banks—Norway's major fishing grounds where some 20,000 fishermen come each February to catch the great schools of cod swimming in from the ocean to spawn—and then to Bodo just above the Arctic Circle. Bodo is the southern anchor of Wideroe's Airline and the alternate terminus for SAS traffic. The third route passes—from Tromso, through Narvik—important shipping center for Swedish steel—and then straight to Bodo, completing the circuit.

Simple, permanent loading facilities are maintained at the major northern terminals such as Tromso (Wideroe's route headquarters), where passengers can board planes from rafts connected to shore by floating ramps. In most cases people, mail and cargo are transported from shore to plane in special launches. Passengers then climb aboard on metal ladders which are drawn into the aircraft before takeoff. Because of the long dark Arctic winter and the absence of all-weather fields with provisions for night flying, the Wideroe route operates only during daylight hours from March until mid-November. Through this period, however, schedules are rigidly adhered to and flights are rarely delayed.

THE standard procedure on most routes is to fly contact. If visibility decreases dangerously, flaps are lowered and air speed is reduced from normal cruising rate of 120 mph to 80. By doing so, flight can be maintained in visibility down to the company's established minimum of one kilometer (about five-eighths of a mile). The limits of safety in relation to the cloud base are left to the discretion of the pilots, all of whom are exceptionally experienced and who fly the same routes more regularly than most commercial pilots.

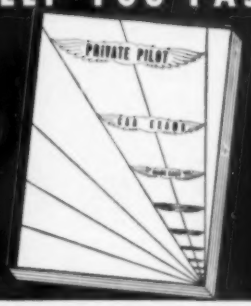
The Otters are equipped with ADF and supported by non-directional radio beacons installed along the routes, including one at Vadso which is particularly useful as the Soviet border is only a few miles distant. VHF radio also is employed for keeping contact with base stations and city-owned launches waiting to meet the planes at their various destinations.

Along these lanes the pilot's day ordinarily ends at sundown, but they remain on call during the night for ambulance flights, an extremely essential service in this remote area. Scattered throughout north Norway are numerous small settlements and isolated family dwellings, many inaccessible except by small boat or long and tortuous auto

(Continued on page 90)

FAA EXAM AIDS

OUR LATEST QUESTION & ANSWER BOOKS HELP YOU PASS NEW FAA EXAMS. GUARANTEE REFUND



EXAM BOOKS

Our latest question & answer books help you pass the new FAA exams quickly and easily. They include a written refund guarantee, charts, revisions etc. Save time, money and effort. Try them at our risk and mail in the coupon today.

ANSWER EXPLANATIONS

This book clearly explains each answer found in the exam book. With both books, you have a complete ground school course. Results will be quick, easy and you will not need a ground instructor, or other books.

FAA CHECK FLIGHTS

This book clearly explains in detail how to pass the new FAA check flight. It describes new maneuvers, new requirements, oral questions and data not found elsewhere. Save time, money, Mail the coupon today.

HOME STUDY NAVIGATION

This book clearly explains how to work all basic type navigation problems in the FAA exams. Explanations of the computer, OMNI, ADF, ILS, etc. are simple, step by step, and easy to understand. Order this book today.

A & E PRACTICAL

This book clearly explains how to pass both FAA mechanic practical tests. It has a money back written guarantee, oral, demonstration jobs, welding, weight & balance, etc. Try this book at our risk. Mail the coupon today.

( ) Private Pilot Exams
( ) Private Answers Explanations
( ) Private Check Flight
( ) Commercial Pilot Exams
( ) Commercial Answers Explanations
( ) Commercial Check Flight
( ) Home Study Navigation
( ) Instrument Pilot Exams
( ) Instrument Answers Explanations
( ) Instrument Check Flight
( ) Powerplant Mechanic Exams
( ) Airframe Mechanic Exams
( ) A & E Mechanic Practical Tests
( ) Flight Engineer Exams
( ) Instrument Instructor Exams
( ) Flight Instructor Exams
( ) Flight Instructor Check Flight
( ) Helicopter Instructor Exams
( ) A.T.R. Pilot Exams
( ) Tower Operator Exams
( ) Dispatcher Exams
( ) Gnd. Instr. Fundamentals Exams
( ) Navigation Instructor Exams
( ) Radio Nav. Instructor Exams
( ) Meteorology Instructor Exams
( ) C.A.R. Instructor Exams
( ) Engine Instructor Exams
( ) Aircraft Instructor Exams
( ) Link Instructor Exams

ANY 4 $10.00 ANY 2 $8.00
ANY 3 9.00 ANY 1 5.00

ACME SCHOOL of AERONAUTICS

Terminal Bldg. Meachem Airport
Fort Worth, Texas Ph. MA 6-2444

☐ Payment enclosed ☐ Send COD
Please mail the books I checked above.

Name_____

Address_____

City, State_____

PERSONAL INSTRUCTION

FOR PASSING FAA WRITTEN EXAMS

You will pass the FAA written exams with 2 to 4 days instruction (average) and understand all the required material 100%. Results will be quick, efficient and guaranteed.

Your instruction will be individual and direct, not lectures. You can start any time. For details mail in coupon now stating your experience or telephone MA 6-2444 or WA 7-7367.

( ) Flight Course
( ) Private Pilot Exam Course
( ) Commercial Pilot Exam Course
( ) Instrument Pilot Exam Course
( ) Airframe Mechanic Exam Course
( ) Powerplant Mechanic Exam Course
( ) Flight Instructor Exam Course
( ) Instrument Instructor Exam Course
( ) Flight Engineer Exam Course
( ) Airline Transport Exam Course

ACME SCHOOL OF AERONAUTICS

TERMINAL BUILDING
MEACHEM AIRPORT FORT WORTH, TEXAS

Please send details on courses I checked at left.

Name_____

Address_____

City & State_____

!TOP PRICES!
FOR YOUR CLEAN USED SINGLE AND MULTI-ENGINED AIRCRAFT!
PHONE, WIRE or WRITE
HOward 2-4105
GRAUBART AVIATION INC.
PORTER COUNTY APT.
VALPARAISO, IND.
Just S.E. of Chicago
CHICAGO SECTIONAL

FRYE'S FAMOUS 'JETS'. . BY MAIL
Black or brown calfskin leather soles, fully lined.
9" Wellington, $16.95
7" Jodhpur: $19.95
Men's, 6-12 A to E
Satisfaction and fit guaranteed.

WRITE FOR FREE CATALOG
TODD'S Dept. 1FY, 5 S. Wabash Ave., Chicago 3, Ill.

SCIENCE
ENGINEERING
BACHELOR'S DEGREE IN 27 OR 36 MONTHS
Accelerated year-round program: Aero., Chem., Civil, Elec., Mech., Metal., Math., Chem., Physics. Modest rate. Earn board. New classes start Jan., March, June, July, Sept. Catalog. 1311 E Washington Blvd., Fort Wayne 2, Ind.
INDIANA TECHNICAL COLLEGE

(Continued from page 89)

trips. There exists a relatively high proportion of doctors in relation to the area's population, but the geography interferes with their missions. As most inhabited areas luckily lie near the coast or on the off-shore islands, they are readily accessible to seaplanes.

Wideroe's has flown nearly 2,000 successful ambulance sorties, averaging between 200 and 300 each year, with the number steadily rising. Although regular air service is discontinued for three months during winter the ambulance flights are never suspended. The Norseman usually is substituted for the Otter on these flights as it is smaller and better for shorter hops.

When an emergency call is received at one of the Wideroe stations, the pilot on "alert" duty is immediately summoned to action, usually from a comfortable bed in the local hotel. Ordinarily, he brings along a doctor and rushes out to the plane which has been refueled and equipped with stretcher and blankets. After no more than 30 minutes the plane is en route.

Ambulance flights require expert flying and navigation in negotiating rough terrain at low altitude and choosing the fastest route to the site of the emergency, often in an area unknown to the pilot. Lighthouses along the coastline frequently are used as navigation guides. Local residents are given instructions on lining up into the wind lighted boats for approach and landing. These flights can be harrowing experiences for all concerned, but Wideroe's pilots continually have proven their skill and resourcefulness in unexpected situations.

In one instance, upon answering a call to pick up an injured man in a desolate interior region 100 miles from base, the pilot landed on a lake, only to be told by people in the vicinity that they knew nothing of any emergency. In spite of a rapidly approaching storm and darkness the pilot took off again, landing in 10 minutes flying time at the small outpost from which the call had originated. He finally was able to trace the whereabouts of the injured man who had shot himself in the foot and was still in transit to the appointed meeting place.

By the time the plane had returned to the original location and the patient made comfortable aboard the sky was completely filled with ominous clouds and it had grown dark. Taxiing had to be accomplished by compass assisted by a boat bearing a paraffin lamp to mark the far end of the lake. After takeoff the flying was entirely instrument, but through a series of precisely time climbing turns the ship rapidly cleared the 8,000-foot cloud formation and returned to base. The pilot called this routine.

Flying one of the north Norwegian arctic routes is a breathtaking experience. Normally, the Otters pass along fjords at low altitude to avoid the high mountains rising above on all sides. The spectacular panorama of lakes, emerald fjords and snow-capped mountains is made even more beautiful by the midnight sun which floods the landscape with soft light 24 hours each day during much of the flying season. One does not soon forget such a spectacle, especially if observed in the early morning hours just after midnight, when the sun is just above the horizon and the colors and clouds combine to produce a startling effect upon the magnificent natural setting.

The Arctic area of north Norway is a fascinating place for low-altitude flying and holds no special problems for small aircraft, even those being operated on a regularly scheduled basis—assuming that the pilot is well trained and quick thinking! END

Helicopter Pilot

(Continued from page 57)

search, rescue and other emergency calls. Smitty has discovered a number of brush fires and reported them by radio before they developed into major blazes. Once, to save time, he landed in a farm yard and phoned the nearest fire department. During the Connecticut flood of 1955 it seemed he was always being called on to fly expectant mothers from outlying towns to hospitals in Hartford.

The only "first" United's S-51 can claim is being the first helicopter to land on Mt. Washington, in New Hampshire. The purpose of this trip was to prove to a South African customer that the ship would land and take off from such an altitude, which is 6,200 feet.

"The first practice trip, in July, 1948, was successfully flown with one passenger," Smith relates. "This flight was accomplished without any trouble but it did demonstrate to me that the lack of full power at that altitude and the very restricted area in which to land required more care and planning than had been necessary at lower elevations, to say the least."

A month later a second trip was made with three passengers aboard and on reaching the 5,000 feet level at the top of Tuckerman's Ravine, the S-51 made a test landing on a bald spot there which was the most suitable place in the vicinity. Two handicaps soon were evident. There was practically no wind that day, which was unusual, and the temperature at that level was 60 deg. F—much higher than Smith had hoped for.

"Our takeoff was not spectacular," Smitty says. Pressed for details, he admits that the 'copter settled onto a rock pile as soon as it moved forward out of ground effect and it was only through split-second flattening of blade pitch that he gained rpm and completed the takeoff. The aircraft then climbed to the summit, landed on a dirt road and took off with the three passengers. The S-51, it was proved, could operate at the 6,200-foot altitude if 200 feet of runway were available when conditions required it.

Over the years United's S-51 has become a better helicopter, easier and safer to fly, because of a number of vital modifications which have improved its performance while making it a more rugged and smoother-flying aircraft. Most important has been the installation of all-metal rotor blades and the adding of servo controls. The metal blades give the S-51 a good increase in performance and a very welcome smoothness.

The hydraulic servo controls changed the job of flying from a rather tiring task of fighting stick forces to an easy job of mov-

ing a light control stick around with finger tip force. With the old control system a round trip from Hartford to New York in rough air was a rugged day's work, but now it is no more tiring than flying any fixed-wing aircraft.

THE improved control is a great aid in hovering and for close-in maneuvering during searches. During the 1955 Connecticut flood, for example, considerable low-altitude spotting and searching was accomplished which would have been extremely difficult with the old blades and controls. As the S-51 flies today, the pilot can almost forget the job of controlling the ship and concentrate on observation work.

Other improvements on the 'copter include added main rotor pylon supports, heavier duty rotor hub, beefed-up control links, and improved bearings in the rotor head. The tail rotor has been changed from a three-bladed wood type to a two-bladed metal rotor on a gimbal hub. Installation of an S-55 type clutch has already given three times as many engagements as the old clutch was capable of and is still going strong after one year of use.

The S-51 has simple flight instruments—rate of climb, altimeter, compass and airspeed, and the usual engine group. The minimum radio requirements are handled by an ARC type 17, VHF.

Maintenance, Smitty has found, is a most vital consideration in helicopter operation, and regular greasing of the main rotor-head and tail-rotor hub every five hours is quite important to long bearing life. These parts are purged of all old grease every 60 hours. Briefly, the maintenance schedule on United's S-51 is: first, daily inspections by the night hangar crew; second, a pre-flight inspection in the morning by the pilot; third, a 30-hour check; fourth, at 60 hours, a more extensive inspection during which the aircraft is moved into the hangar and all instruments, components and controls, and the engine, are inspected; fifth, at 120 hours, an even more intensive inspection in which a few more mechanical units are taken apart, and the transmission changed; sixth, a 250-hour general inspection at the Sikorsky plant which takes three days and especially concerns the link bearings in the rotor head; seventh, a 450-hour major at Sikorsky, including an entire overhaul of the rotor head and magnafluxing of the main rotor hub; and eighth, at 600 hours, major work on the main transmission, intermediate and tail gear box, also performed at Sikorsky.

The general average operating cost for an S-51 has been computed at $75 per hour. This includes repairs, replacements, pilot's salary, depreciation, insurance and mechanics' salary, and, of course, fuel and oil. It does not include hangar storage and other facilities connected with the helicopter operation. To date United's S-51 has logged a total of 4,500 hours and is still going strong.

Probably no helicopter has been operated as a business aircraft for such a long period as United's S-51. This, of course, has been only one small part of the helicopter picture. Every day, all over the world—even into the Arctic and Antarctic—helicopters are proving their unique place in aviation. No other vehicle, either in the air or on land or sea, has been as versatile. END

VFR MAP CASE

• Designed Specifically for the Private Pilot
• Fits easily in the cockpit of any light plane

$24.75
postage and 10% Federal Tax included

• Rigid Construction
• Top Grain Cowhide
• Your choice, Black or Ginger

A place for everything in this compact 3¾ x 9¾ x 13¼ map case. Top folds back for easy access. Pocket for sun glasses, computer, and plotter. Sections for Airman's Guide, and Airport Directory, Sectional Charts and Trip Maps. Even holds a spare shirt! Locks with a key. Your name embossed in gold $1.00 extra.

Satisfaction Guaranteed or your money back!
(No refund if name embossed)

Varsity Shop Specialties
(38 years continuous business)
6321 Hillcrest Ave.
Dallas 5, Texas

Ship Post Paid
_____Map Cases
Enclosed $_____
☐ Black ☐ Ginger

NAME _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

☐ Cash ☐ Check ☐ Money Order ☐ C.O.D.
(50c extra for C.O.D. . . . No C.O.D.'s to Canada)

PRESENTING THE PATHFINDER 100B OMNI
BY LEE AIR ELECTRONICS

$345.00
Complete with cables and omni antenna customized to your plane.

This outstanding omni directional finder is the most advanced, most complete and embodies the most desired features. Easy to install, the Pathfinder can be mounted anywhere on the instrument panel

The Pathfinder 100B Omni features...

- Size: Standard 3¼" x 3¼" instrument case. Total length 7" (6" behind the panel including plug). Weight: 23 oz.
- Power Requirements: 12 to 14 volts at a maximum current drain of .095 mils or the equivalent of a standard three cell flashlight.
- Accuracy: Plus or minus two degrees under all conditions when used with any VHF receiver. It will perform as specified with any VHF receiver with a 2700 ohm output impedance from omni output of receiver with a minimum of 1.0 volts to 2.0 volts RMS.
- Course Sensitivity: 15 degrees off course gives full color scale deflection.
- Over-all System Sensitivity: 1½ microvolt antenna signal provides usable and stable indication when used with any VHF receiver.
- "To-From" Flag: Flag shows TO or FROM automatically. Complete with full color scale course deflection.
- Standard Circuitry: Standard components obtainable at any radio or television parts house, and fully transistorized.
- Fluorescent Dial for Night Flying.
- Acceptance: This V.O.R. Omni is manufactured to meet TSO category acceptance compliance.

WRITE TODAY FOR COMPLETE INFORMATION

LEE AIR ELECTRONICS, 845 W. 11th St., Upland, Calif. F-11

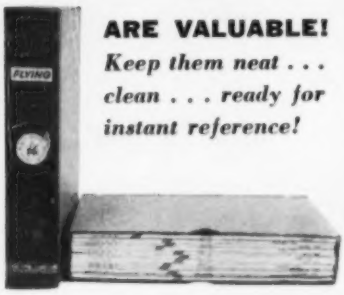
Please send me more information on the PATHFINDER 100B OMNI.

NAME _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

DEALERS AND DISTRIBUTORS INQUIRIES INVITED

YOUR COPIES OF

FLYING



ARE VALUABLE!

Keep them neat . . . clean . . . ready for instant reference!

Now you can keep a year's copies of FLYING in a rich-looking leatherette file that makes it easy to locate any issue for ready reference.

Specially designed for FLYING, this handy file—with its distinctive washable Kivar cover and 16-carat gold leaf lettering—not only looks good but keeps every issue neat, clean and orderly.

So don't risk tearing and soiling your copies of FLYING—always a ready source of valuable information. Order several of these FLYING volume files today. They are $2.50 each, postpaid—3 for $7.00, or 6 for $13.00. Satisfaction guaranteed, or your money back.

JESSE JONES BOX CORP.
Dept. F, Box 5120, Philadelphia 41, Pa.
(Established 1843)

PICTURE CREDITS

8, 106—HOPKINS PHOTOGRAPHY CO., LEE ANGLE PHOTOGRAPHY, AL ACHTERBERG

32, 34, 35—NASA, PETER SHEPHARD, HOWARD LEVY

36, 37—LOU DAVIS; OFFICIAL PHOTOGRAPH, U. S. NAVY

38, 39—STUART DAVIS

49—GERALD J. SCHLAEGER

52, 53—HOWARD LEVY

55—WIDE WORLD PHOTOS

63—DON DOWNIE

64—HOWARD LEVY, BEN & SID ROSS

THE THRUST LEVER

By CAPTAIN DAVE KUHN

THE LAW REQUIRES that pilots report any "near misses."

Pilots making these "near-miss" reports are exposed to all sorts of abuse. They may be fined, grounded, or have their licenses lifted. Consequently, not many pilots are turning in any "near-miss" reports.

What about the system airplanes operate under? For over 20-odd years (and I mean odd) a gradual stockpiling of rules, regulations, procedures and controls have all but put a strait jacket on pilots trying to get from point A to point B. Even with the comparatively new idea of radar surveillance, none of the old rules have been abandoned.

Pilots must maintain 10-minute separation, en route, at the same flight level. When this first was made law, the DC-3, cruising at 170 mph, had about 28 miles of space between it and the one ahead. With jets cruising at 600 mph, there is about 100 miles of clear air between airplanes. Since the radar has all the jets on the scope, it would appear airspace is wasted.

This is only one example. We now have only a fraction of the jets flying that will eventually need room on our airways. The carriers compound the congestion by the "swarm formations" started from the large terminals. At the magic hour, TWA, AAL, CAL, and UAL all will crank up at LAX and head for ORD. They all want the same altitude and the same route. Some won't get them.

At low levels jets use fuel like it is going out of style. The 10-minute restriction forces pilots on the same course to orbit, lose time and curse.

As the tower reads off a clearance, the pilot must write it down and repeat it word for word—like this:

"TWA Flight One, you are cleared from Idlewild to the Los Angeles Airport, hold runway heading until reaching 800 feet, make a left climbing turn to Lido, thence via the southeast leg of Hempstead to intersecting the 117-degree radial of Stillwater VOR, thence via the 88-degree radial of the Stillwater VOR to intercepting the Jet six-four airways to Phillipsburg, flight plan route.

"Cross Lido at 1,500 feet, the 51-degree radial of Colts Neck at 2,500 feet, the La Guardia outer marker at 4,000 feet, the northeast course of the Newark ILS at 6,000 feet, the southwest leg of the Teterboro low frequency range at 7,000 feet, climb to and maintain 8,000 feet."

New York controllers talk fast. With the number of ships waiting for a clearance, they have to talk fast. When they are reading you a clearance, it is frightening.

You might be on solid instruments and get, "UAL 851, there are two high-speed transponder targets at 12 o'clock, 10 miles, closing fast, now change to Agony Control, on frequency 133.20, for further flight following." Small wonder we have "near misses."

I must emphasize that this is no criticism of the controllers. They do a fine job with the tools with which they have to work. The unwieldy system is unsuited for modern day air traffic. A jet is there and gone before the word can be passed along. Should a pilot request permission to detour a weather area, leaving the airway, he always gets the "stand by."

The ground man he made the request of must call the head controller (perhaps a thousand miles away and busy on the phone) who in turn must have his helpers check for other traffic in the neighborhood, who in turn advise the head man, who in turn calls back to the first man, who in turn tells the pilot "yes" or "no."

Is there an answer? There should be. It should be simple. What the pilot needs for avoidance of other aircraft is some uncomplicated little gadget in the cockpit that will alert him to essential traffic. He has the controls handy and can turn away from disaster without going through "39" other impulses.

We have smart boys in this country that are sending mice, monkeys and shortly men, into outer space. They send up equipment that can talk back to us from thousands of miles out there, take pictures of the moon, gather information on radiation, make recordings and broadcast speeches. Surely they can devise a little gadget that will warn pilots of other ships. With modification, some of the equipment available might be the answer.

The military have ultra-high frequencies. When one aircraft broadcasts, another equipped with a direction finder can spot him. At least he can tell what direction the transmission is coming from. Why not equip all planes with a little transmitter (going all the time in flight) and a direction finder on a common frequency?

Of course, we must keep all eastbound flights at odd thousands and the west-bound at even thousands. We must have referees at the terminals to sequence takeoffs and landings.

With some sort of reliable instrument in the cockpit to warn the pilot of the aircraft ahead, we could break the bottlenecks of the airways.

Radio Navigation

(Continued from page 61)

eight to 10 kts., variable from the W and SW, and I estimated my ground speed at 96 mph on the 260-deg. track to Cleveland omni. Off the ground at Cleveland-Hopkins at 1015, the 16 miles to the omni station would take some 10 minutes. In the Cleveland omni column block time portion of the flight log (Fig. 2) I recorded the estimated 10 minutes time atop the diagonal. Then, dropping to the next line of "Estimate," I wrote in 25. This indicated that I estimated crossing the Cleveland omni at 25 minutes past the hour. It was figured by adding the 10 minutes to the takeoff time of 1015 and then recording it at the arrow's tip.

When the omni needle indicated that the Stinson had passed over the omni, I began to turn to a heading of 147 deg. for the track out, while recording the time in the flight log. It had taken 12 minutes instead of the estimated 10. The 12-minute time was entered below the block time diagonal, and the actual time of 27 minutes past the hour was entered on the "Over (on-off)" line. A quick use of the computer found the actual ground speed of 80 mph.

Established on a track-out of 147 deg. my next concern was to estimate my arrival at intersection "A." Then I glanced at the intersection "A" column of the flight log: the measured distance was 21 miles and, with the wind now pegged from the SW, I figured roughly a ground speed of 105 mph and a time of 12 minutes. The 12 was entered above the diagonal, and this 12 minutes, plus the actual time over the Cleveland omni (27 minutes past the hour) gave me an estimate of 39 minutes past the hour when I would arrive at intersection "A."

Leaving the paper work for the time being, I tuned the low-frequency receiver to the Akron-range frequency of 362 kc. and received a strong N-quadrant signal. My plan was to fly the Cleveland omni track-out course of 147 deg. until I intercepted the full on-course signal of the Akron range, and then steer 110 deg. or so to keep on the right feathered edge of the low-frequency beam.

FOLLOWING this plan, I just kept the omni needle centered (volume turned down) while listening to the on-course signal of the Akron range grow louder. It was actually 41 minutes past the hour when I heard the full on-course signal and changed course to 110 deg. Time then to intersection "A" was 14 minutes (entered below the diagonal) and the actual ground speed was 90 mph.

Completing the second leg, I found that the 110-deg. heading positioned the Stinson on the right edge of the beam, and I looked at the Akron column of the flight log. Distance to the cone of silence from intersection "A" measured 22 miles, and as I had made but a 30-deg. heading change, I used the last-figured ground speed of 90 mph and estimated the cone of silence in about 15 minutes. This was entered above the diagonal on the block-time line. Fifteen minutes, plus the actual time over intersection "A" (41 minutes past the hour), gave me an estimate of 56 minutes past the hour.

Apparently the Stinson made a little better time than anticipated as it crossed over the cone in 13 minutes rather than in 15. The 13-minute time was entered below the diagonal, and the actual time of 54 minutes past the hour was entered in its appropriate box. Ground speed figured out to 101 mph.

The next leg to intersection "B" also measured 22 miles and I estimated it at 07 past the next hour, or in 13 minutes. After entering the figures in the flight log, I tuned the omni receiver to the Youngstown omni and set the course selector for the 40-deg. radial to the station. The omni needle swung to one side and stayed there.

As the minutes and miles ticked off, the omni needle began to stir and creep slowly toward the center position. At exactly 07 minutes past the hour, it centered and I turned the airplane to a heading of 40 deg. With a tailwind now, I figured a ground speed of 120 mph to Miller's Airport—the six miles would take three minutes, and place me over the field at 10 minutes past the hour. Even though I had the field in sight as soon as I turned the Stinson on to the 40-deg. radial of the Youngstown omni, I flew out the time and course, and was right over the field when the panel clock read 10 minutes past the hour. I checked the field for traffic and then throttled back to lower into the traffic pattern.

And now for the second example. I set up a practice run on a trip from the Youngstown municipal airport to Lost Nation airport (see Fig. 4). I planned to fly by way of the Lenox airport, and land there if a friend's airplane was seen on the ground. If not, I would go on to Lost Nation.

TAKING off from Youngstown, I homed on the omni, then tracked out on the 350-deg. radial. After establishing a heading on the directional gyro which would keep the Stinson on the selected radial (the gyro heading was 345 deg., which included a wind-drift correction), I continued to fly the course by reference to the directional gyro. Then the Superhomer was tuned to the Chardon omni, with the course selector set at 70 deg. from the station. The Chardon 70-deg. radial intersects the Youngstown 350-deg. radial at the Lenox airport.

Slowly the omni needle began to creep toward the center of the meter as I approached the Chardon 70-deg. radial. When it centered, I looked down and found that I was within a quarter of a mile or so beyond the airport, close enough for VFR operation.

Circling Lenox, I didn't see my friend's airplane, so I climbed back up to cruising altitude and started in the direction of Lost Nation, a course of 275 deg. Lost Nation, several miles NE of Cleveland, operates both a low-frequency, non-directional radio beacon, and a TVOR. In this case I elected to home in on the low-frequency signal.

To set this up, I tuned the low-frequency receiver to 263 kc. identified LNN and then turned the antenna selector to fixed loop. Listening to the loop signal, I swung the airplane gently left and then right and

(Continued on page 94)

Prepare Now at

Northrop Institute

COMPLETE YOUR TRAINING

IN JUST TWO YEARS

The "Count Down" period of your life is NOW. How far you go in your chosen career field and the degree of success you attain, depends on your **educational preparation.**

At Northrop Institute you can get a fine education in Aeronautical, Astronautical, Electronic or Mechanical Engineering Technology—and you can get it in only 2 years. Then, if you elect, you may continue your education at NIT and obtain a Bachelor of Science Degree.

Thousands of young men like yourself spent their "count down" period at Northrop Institute. They are now successfully holding responsible positions with many of the largest companies in America ...companies engaged in practically every field of industrial activity.

So don't delay. You owe it to yourself to get complete free information on Northrop Institute courses.

Northrop Institute of Technology

A privately-endowed, non-profit College of Engineering

1119 W. Arbor Vitae Street, Inglewood 1, California

MAIL COUPON FOR COMPLETE INFORMATION

NORTHROP INSTITUTE OF TECHNOLOGY
1119 W. Arbor Vitae Street, Inglewood 1, Calif.

Please send me immediately the Northrop Catalog. I am interested in a career in the field of:

- ☐ Aeronautical & Astronautical Engineering
- ☐ Electronic Engineering
- ☐ Mechanical Engineering
- ☐ Aircraft Maintenance Engineering
- ☐ Airframe & Powerplant Maintenance
- ☐ Jet Engine Maintenance

Name ..... Age ...

Address .....

City ..... Zone ... State .....

Veterans: Check here ☐ for special information.

WANTED!
Used Airplanes, Equipment, or Accessories!

FLYING's 220,000 buyers are always in the market for a good used plane or equipment buy. If you have something to sell, let FLYING's classified columns sell it for you. It costs very little, just 50¢ a word, including name and address. Minimum message: 10 words. Make FLYING's classified columns your market place for selling, buying, or trading!

For further information write:	Martin Lincoln FLYING One Park Avenue New York 16, N. Y.

LIGHTPLANE REVIEW

A comprehensive digest of round-the-world activity in the lightplane industry and sport flying movement. Packed with information of current as well as historical interest. Profusely illustrated with photos, 3-views and detailed cutaway drawings of all types of lightplanes—including the latest single-engine and light-twin personal aircraft, experimental types, ultra-light sportplanes, famous racers and classic aircraft. Published quarterly. Order your copy of the Winter 1960-61 issue today. $1.00 per issue.

LIGHTPLANE REVIEW
Dept. F, Post Office Box 167, Glendale, California

FLY YOUR OWN HELICOPTER

The Commuter Jr.—A helicopter that can be assembled in your home workshop. Parts and drawings available.

Send $2.00 for photo illustrated brochure, specs. and price list. Send additional $2.00 for book "Basic Helicopter Aerodynamics," used Commuter Jr. for performance Calculations.

HELICOPTER RESEARCH CO.
Box 121 (F)
LA MIRADA, CALIF.

(Continued from page 93)

found the null in the signal (the point of minimum signal when the loop is at right angles to the transmitting station). While holding the airplane on a heading which coincided with the null of the signal, I set the gyro compass to read 360 deg. By doing so, it then became a "left-right" indicator and I steered the airplane to keep the gyro reading 360 deg. If I drifted off course, left or right correction was made to bring the 360 back to center of the gyro face.

For the cross-check, I again used the Chardon omni and set the receiver for the 315-deg. "from" radial. Since wind velocity was low and constant in direction on this leg, it did not cause any major problem. About every six minutes or so I would check the gyro against the null signal, make any adjustment necessary to continue to home in on the low-frequency radio beacon in as straight a line as possible. When the omni needle centered, I found myself directly over Lost Nation at 3,000.

The examples of radio navigation practices covered in this article are but two of the many ways that a pilot can utilize radio aids for VFR cross-country. With additional radio equipment over that of the Superhomer and low-frequency receiver he can establish fixes over fan markers, outer markers, and range stations; he can utilize both the front and back courses of the localizer to find the airport and instrument runway; he can "slide down" the glide slope for a simulated ILS; he can home in on broadcast stations if VHF facilities are not available, as in some remote areas.

If you have radio-navigation gear in your aircraft, set up a radio-navigation primer program and watch your ability grow to fly to a destination without landmarks. END

Tradewind Airport

(Continued from page 63)

"just to keep junk off the field," explains Siler.

"We won't allow a derelict airplane on the field," says the airport manager. "If anyone wrecks a plane on the airport, it goes under cover the same day."

One of the key factors in the growth of Tradewind is its proximity to downtown Amarillo. The two-mile drive now takes six minutes, but a new freeway nearing completion will cut this time in half.

The prime factor in the growth of the airport, however, has been a continuing effort to give outstanding service.

"It's awfully easy to talk about service," says Siler, "but doggoned hard to keep providing it day and night, good weather or bad. The type of line service that an airport provides is a direct reflection on the entire operation. We try to give the same type of service as a first-class gas station. Our line boys work six days a week, eight hours a day and receive time-and-a-half for everything over 40 hours; double time on holidays. They get a free $5,000 life insurance policy and very liberal hospitalization insurance that we split 50-50. After two years, they are eligible for our retirement plan.

"The line boys can use any of the corporation's aircraft at half price and we furnish the gas. At present, four of our nine line boys are also pilots. We feel that this is the best possible business, both for the airport and for our customers," said the airport manager.

Last year the Tradewind Airport pumped 350,000 gallons of gas.

Throughout the years, Tradewind has tried many "gimmicks" to appeal to the customer. They placed paper napkins in the cockpits for checking oil dip sticks, and printed check lists and radio frequency cards, but most customers complained about having their cockpits cluttered up with junk. However, one item has met with approval. During the summer months when the air over Texas can be just a bit bumpy, each plane that lands at Tradewind for service has a supply of airline sick-sacks placed aboard.

One of the sales promotional ideas used at Tradewind is the offer of 20 hours' dual instruction in a Beech Bonanza for $500 to any prospect who needs an airplane. Then, when he decides to purchase either a new or used airplane from the corporation, the $500 is discounted from the purchase price.

Tradewind operates its own cafe at a financial loss. "We give the cafe operators everything they make and $100 per month in addition," explains Siler. "A good cafe on an airport is a necessity and we just can't afford not to have one in operation.

One of the most photographed landmarks in non-scheduled aviation is the 20-foot telephone pole erected at Tradewind in 1946. Arrows point in the general direction of larger towns and list the airline mileage to each town.

The stockholders of Tradewind know from bitter experience the problems of building an airport. On May 15, 1949, at 8:20 PM, a tornado hit the airport, dead center. Of the 60 planes on the airport at the time, 40 were at least half demolished.

Flying visitors in Amarillo may call Tradewind Unicom on 122.8 to arrange for service, tie-down or hangar and a rent car or courtesy transportation to town by any of a number of motel operators.

No wonder the slogan of Amarillo's "other" airport is, "more pilots land at Tradewind." END

Future of VTOL

(Continued from page 35)

maximum disk loading for the compound helicopter will be about 10 lbs. per sq. ft. compared to five or six lbs. per sq. ft. for a pure helicopter. As the rotor or propeller diameter is reduced to the size of some tilt-wings and more advanced VTOL aircraft, the disk loading goes up to 50 lbs. per sq. ft. and above and the velocity from the propeller reaches 200 mph and more. The dust and debris raised by such machines will blind the pilot and clog the engines if landings are attempted on unprepared terrain rather than on clean concrete ramps. If jet engines are turned downward to lift the aircraft, their exhaust will break up con-

crete ramps if the engines are not properly placed and the takeoffs made quickly.

The downwash problem is clearly one of the most serious facing the high performance VTOL aircraft, and it must be solved before they can be used by the military. A number of ideas for preparing a landing site by dropping material from a hovering VTOL are under consideration.

Next step beyond the compound helicopter also has been discussed at some length. It seems probable on the basis of today's information that this will be a combined tilt-wing, deflected-flap airplane using interconnected turboprop engines. Wind tunnel and flight research with the various types of VTOL aircraft has shown that this type probably would have fewer technical problems than any other and that it could be developed to an operational state with several years of concentrated effort.

The combined tilt-wing, deflected-flap airplane would be the first true VTOL airplane in the sense that it eliminates the rotor and its top speed therefore could approach that of any other airplane with a similar propulsion system. With the turboprop engines this airplane could cruise in the 300- to 400-mph area and be superior to the most advanced helicopter on a cost, payload delivered and time utilized comparison at ranges above 300 to 400 miles.

Two of the main advantages of this type VTOL aircraft are: great resistance to stall if flaps and slats are properly articulated with the movement of the wing as it tilts, and very good STOL performance in an overloaded condition. Wings of this type will be able to provide landings and takeoff of the heavily overloaded VTOL in areas about the size of football fields with approach angles of about 40 degrees.

Research work to date with the various types of VTOL aircraft has shown that all of them have problems. The tilt-wing, deflected flap aircraft discussed above has a very strong tendency to dive during takeoff and landing because of the large flaps. Aircraft with lifting fans in their wings or in a broad flat-bottomed fuselage can experience a serious loss of lift when near the ground. A negative pressure is created under the aircraft because the high-speed air from the fan exhausting along the ground induces a strong inflow of air along the lower surfaces of the wing and fuselage.

THE generally accepted conclusion regarding VTOL research work, however, is that none of the problems has been revealed to be insurmountable or to be in opposition to some basic law of flight. Few people doubt that it would be possible to solve the basic problems revealed by the current research aircraft and to build several types of VTOL airplanes which would have satisfactory stability and control characteristics.

For instance, the problems just mentioned can be solved because their exact nature has been revealed through research in recent years. The large nose-down or diving moment on wings with very large flaps can be counteracted through using a large wing chord, placing the propeller hub in exactly the right spot with regard to the wing chord and properly designing the pitch controls on the horizontal tail. The undesirable flow conditions and negative lift under a wing or fuselage carrying a lift-fan largely can be eliminated by keeping the fan exit at least two fan diameters above the ground. If this is not possible through the use of long landing gear or high wings to keep the fans the necessary distance above the ground, then spoilers—possibly retractable spoilers—can be used to break up the inflow of air which passes along the lower surface of the aircraft.

While many experts believe that a tilt-wing, deflected-slipstream VTOL aircraft probably will succeed the compound helicopter, this certainly depends on the amount of support the other types of VTOL airplanes receive during the next four years. Ducted-fan, tilting-rotor, lift-fan and other types of VTOL aircraft have shown considerable promise, and it is possible that even with limited support one of them might become serious competition. Even though government support of most of these vehicles apparently is going to stop, a few large companies are still considering spending money on a few of them for another year or so.

Engines have always been said to be the key to building successful VTOL aircraft. This is especially true now that it appears that the stability and control problems are surmountable. As engines become more powerful and efficient so that their thrust-

(Continued on page 96)

Jules Manger, Jr., Chairman of the Board, Manger Hotels, is seen with his wife and two of their seven children, all ardent flying enthusiasts.

"I find that flying my own plane is a big time-saver in business and allows me more time at home with my family. It's often necessary for me to make quick trips to our hotels, and the easiest, fastest way is to fly myself.

"If you're flying 'our way', why don't you stop with us? In all Manger Hotels, you'll get the best accommodations, and the friendliest kind of service."

Jules Manger

"Flying Businessmen" appreciate Manger Hotels' ideal locations, excellent accommodations and fine food. For a Manger Credit Card and information, write: Executive Offices, 4 Park Avenue, N.Y.C.

ALBANY, N.Y.
THE MANGER
DeWITT CLINTON

CHARLOTTE, N. C.
THE MANGER MOTOR INN

CLEVELAND, OHIO
THE MANGER

GRAND RAPIDS, MICH.
THE MANGER

NEW YORK CITY
THE MANGER VANDERBILT
THE MANGER WINDSOR

PHOENIX, ARIZ.
THE MANGER
DESERT SUN MOTEL

ROCHESTER, N.Y.
THE MANGER

SAVANNAH, GA.
THE MANGER
THE MANGER TOWNE & COUNTRY MOTOR LODGE

TUCSON, ARIZ.
THE MANGER
TUCSON INN

WASHINGTON, D.C.
THE MANGER ANNAPOLIS
THE MANGER HAMILTON
THE MANGER HAY-ADAMS

The Friendliest Name in Hotels

THE SECRET OF A GOOD BUY IS

KNOWING EXACTLY

WHAT YOU'RE LOOKING FOR!

And when it comes to photo equipment, there's one sure source for the facts and figures that will help you make a decision before you buy!

THE NEW

Complete listings on over 5,000 pieces of photo equipment...data, prices, illustrations and comparisons of:

- Still Cameras
- Accessories
- Movie Cameras & Projectors
- Lenses
- Underwater Gear
- Lighting Equipment
- Darkroom Supplies
- Stereo
- Films and Papers

PLUS:

new Comparison Charts on Tape Recorders, Filters, and Electronic Flash.

The 1961 PHOTOGRAPHY DIRECTORY AND BUYING GUIDE is now on sale at your favorite newsstand.

ONLY $1.00

(Continued from page 95)

to-weight ratios go up and their fuel consumption goes down, then the performance of VTOL airplanes will improve and become more and more economical. The only catch to this outlook is that these improved engines can always be used to improve the performance of helicopters and conventional airplanes. And for certain jobs VTOL aircraft never will be more economical than helicopters and conventional airplanes.

There is a portion of the flight spectrum in which VTOL airplanes will be best, but if the requirement is to carry large loads for relatively short distances and to hover for several minutes during each flight, then the helicopter and its large slow-turning rotor is the most efficient vehicle man has ever suggested. If the requirement is to fly 800 miles or more and it is possible to use long runways for landing and takeoff, then the conventional airplane will always be more efficient than the VTOL airplane. The conventional aircraft requires an installed thrust equal to about one-third of its maximum gross weight because its wings support it at takeoff. In contrast, the VTOL airplane needs an installed thrust of at least 105 per cent of its gross weight to make a vertical ascent.

Major advantages of VTOL airplanes in the near future appear to be their ability to take off and land vertically and operate fairly economically at ranges between 300 and 800 miles. Many designers also see them as possible contenders in the supersonic aircraft field during the Sixties and the decade to follow. END

Ditching

(Continued from page 51)

DC-6, Constellation, B-25, B-26, Boeing 707 and various other military aircraft. Although such reports cannot begin to get to each specific aircraft type, they do afford general conclusions which may apply in some degree to your aircraft.

"From a ditching standpoint," reads Re. 1347, "the vertical location of the wing with respect to the fuselage is a compromise between having the wing low enough to provide buoyancy to help keep the airplane afloat after ditching, and having the wing high enough so that the landing flaps and engine installations do not seriously impair ditching behavior. It is generally considered that the most favorable position of the wing is slightly above the bottom of the fuselage or in a low midwing position.

"The thickness and size of the wings had little effect on ditching behavior other than the obvious effect on buoyancy. Swept-back and delta wings had little hydrodynamic influence on ditching but they did have aerodynamic influence on handling and landing characteristics."

Considering only the effect of wing position and shape, it may be expected that aircraft with a high or shoulder wing will be easier to put on the water than low-wing aircraft. This is true because those parts of the airfoil which are helpful in controlling attitude at touchdown, and for some portion of the runout, are less subject to impact damage if they are located high on the fuselage (Piper PA-18, PA-11, J-3, Family Cruiser, Pacer and Tripacer; Aeronca Champ; Luscombe; Cessna 120, 170, 172, 180, 182, 195; and others).

However, the high-wing aircraft will receive no flotation help from wing buoyancy, resulting in a more rapidly submerged fuselage and less available time for crew escape. The low-wing aircraft is best from the standpoint of floating and escape time but is more likely to lose such items as flaps, slats and even whole wings on impact (Ercoupe, Mooney, Swift, Navion, Beach Bonanza, Bellanca Cruisair, Piper Comanche).

The midwing or low midwing design provides some planing surface without too great a sacrifice in flotation. Other factors include:

- Large aircraft experience less violent gyrations than small ones. Larger aircraft have better ditching characteristics.
- Flaps reduce landing speed, deceleration and impact forces and length of runout. Flaps cause some slight diving tendency on a low wing—if they are still hanging on during the water run but always should be put down full—and early.

These same general rules apply to all high-lift devices, whether leading or trailing edge types.

- Deceleration forces and diving tendency are considerably higher with gear down. The retractable kind should be kept wheels up. If the fixed gear will not come up because of some malfunction, the ditching attitude should be slightly more nose high (10-12 deg.) than with the gear-up configuration where five to eight deg. is better.
- With a twin, the thrust, if any, and the hydrodynamic drag, should be kept symmetrical at the instant of impact. If no power is available, both props are feathered for best glide.

If partial power is available and is symmetrical, it is used to pick the touchdown spot and to reduce the rate of descent.

If the power is not symmetrical or one prop will not feather, the answer is the same—if one prop won't feather and ditching is inevitable, don't feather the other. If partial power is available on one engine, it is used in the approach and then cut—and prop feathered—just before the flareout.

- Wing-tip auxiliary fuel tanks recently have become available for the Beech Bonanza, Piper Comanche and the Ryan Navion. These are low wing aircraft and the tip tanks are of such a shape as to provide improved planing during a water runout.

Tip tanks should be emptied by burning down fuel or by transferring it to the internal tanks, if possible. Empty tip tanks provide additional buoyancy and escape time.

- Landing lights—to most people who have looked many times at their effects on water—cause a nearly blinding glare and make the judging height even more difficult.
- If no emergency door release or built-in door stop is installed in your plane, open the door before ditching and keep it cracked open with an article of clothing or even a crumpled map. The buckling stresses in a ditching may easily jam the door shut unless it has been held open by some device.

When the aircraft first submerges the water pressure may keep the door shut despite your efforts. Don't panic. Wait until the cabin fills with water and the pressures are equalized, when the door can be opened easily.

An air pocket may form where you can keep your head (literally and figuratively) and breathe—maybe only once or twice but breathe nevertheless. When the door can be opened, take one more deep breath from the trapped air supply and go.

- Stow gear so that it cannot fly about dangerously during a crash landing.

So far, not much has been said about pilot technique. The following revealing quote is from *Aircraft Emergency Procedures Over Water:*

"In a landplane ditching, probably the least important of the three controlling factors *after touchdown* (sea, type aircraft, and skill of pilot) is the skill of the pilot. The pilot's task essentially is to set down the aircraft on a proper heading, in the right spot, at the best combination of the attitude and speed. The importance of a low touchdown speed must be appreciated. The energy of the aircraft, which must be dissipated during the runout, is proportional to the square of the speed. Touchdown should be at the *lowest* speed and rate of descent which permit safe handling and optimum nose-up attitude on impact."

THE key words are, "optimum nose-up attitude," Notice that even speed, important as it is, becomes subordinate to attitude. After all, how much worse is it to have a head-on collision at 70 mph than at 60 mph? Forgetting everything else, the best nose position for ditching is very slightly nose high, as mentioned previously, like five to eight deg. with gear up, 10 to 12 deg. with fixed gear or gear down.

Nose position is of paramount importance. Landing with the nose down leads to an immediate dive and disastrous impact loads. When the aircraft is landed with the nose too high, the afterbody digs in hard and the nose is slammed down as in a hammerhead stall. No nose section is built to take this kind of punishment.

Recommended nose position cannnot always be pinned down to an exact number of degrees. The best advice may just use a general statement such as "nose high," "slightly nose high" or "normal landing attitude."

Some recommended figures give an idea of what to expect from various configurations: Convair, nine deg.; DC-6, 12; Constellation, nine; B-25, 12; B-26, six; and the Boeing 707, 12.

Along with lower impact speeds, the lightplane has the advantage of a very short water runout—on the order of 100 feet. Make the most of this happy circumstance and make any off-shore ditching close into the beach.

A landplane ditching always involves a financial loss and frequently ends in the total loss of an airplane. But if you have prepared yourself and your aircraft as fully as possible to meet such an emergency, you will be around to fly again. END

BUT:

You can prepare for all of your written FLIGHT TESTS right in your own home through the NEWLY DEVELOPED ROSS CORRESPONDENCE COURSES offered for Private, Commercial and Instrument Ratings

Any student enrolled in our correspondence program is privileged to attend classes at our resident school in Tulsa, Okla., at NO EXTRA CHARGE!

WRITE NOW! FOR COMPLETE DETAILS

MAIL TODAY

ROSS SCHOOL of AVIATION

Route Five, F-2 Riverside Airport Tulsa, Okla.

You bet I'm interested. Without obligation, Please send me information on courses checked:

☐ Instrument ☐ Commercial ☐ Private

Name _____ Age _____

Address _____

City _____ Zone _____ State _____

Someone had to FLY it...

Since the moment the WRIGHT BROTHERS' "FLYER" first became airborne on that historic flight —man's quest of the skys has increased at a very rapid rate. Today, still thrilling as ever—flying has become an exacting science. Adequate training in this field is essential for safety and a prerequisite for a highly rewarding and profitable career.— Ross offers just such training.

ROSS operates an accelerated Flight School Program, 7 days a week. Courses start every Monday, offering both day and night ground school. At ROSS' you will use full automatic Link Trainers, and 1960 model Piper aircraft. Our instructors are the finest. We are the largest supplier of pilots to the Nation's Airlines. Ross specializes in training you for your ratings in a HURRY. TRAIN WITH CONFIDENCE AT ROSS.

Spanish speaking Instructors available for Latin American Students

MAIL TODAY!

ROSS SCHOOL OF AVIATION

Route Five, F-2 Riverside Airport Tulsa, Oklahoma

You bet I'm interested. Without obligation, Please send me FREE information on courses checked.

☐ Instrument ☐ Commercial
☐ Airline Transport ☐ Flight Instructor
☐ Multi-Engine ☐ Link Instructor
☐ Flight Engineer

Name _____ Age _____

Address _____

City _____ Zone _____ State _____

ROSS FAA EXAM AIDS

NEW - JUST REVISED!

Only $5.00 EACH

Earn More in Aviation

READ YOUR WAY TO HIGHER PAY with the informative Ross FAA typical question and answer books, clearly and concisely prepared to expedite your aviation RATINGS.

NOW— Authentic Recorded two-way tower to plane, and plane to tower conversations— allow you to learn traffic control & flight information easily.

Send for this latest Traffic control & flight info record now. Complete TWO-WAY flight communication training — — only $7.95

NAVIGATION AND METEOROLOGY MAPS INCLUDED FREE

CLIP & MAIL

ANY 1....$3.00 Each or ALL 10....$25.00

☐ Payment enclosed, ship postpaid. ☐ Send C.O.D.

These books contain the very latest information

☐ Private Pilot ☐ Instrument Instructor
☐ Commercial Pilot ☐ Airframe Mechanic
☐ Instrument Pilot ☐ Powerplant Mechanic
☐ Airline Pilot ☐ Flight Engineer
☐ Flight Instructor ☐ CAR for all Ratings

Name _____

Street _____

City _____ State _____

Ross Aero Publishers

Route 5 F-5 Riverside Airport Tulsa, Okla.

Ask the man who flew one* around the world

***The twin-engine Super-V, of course!** Pan Am pilot Chuck Banfe made his famous round-the-world flight in the Super-V in 8½ days, 212 hours air time—as much time as many business planes fly in a year. Said Chuck, "In the 21,000 mile flight I ran into everything... freezing rain, hail, salt and dust storms, thunderstorm activity... and the only maintenance the Super-V required was cleaning the spark plugs." When offered mechanical services on the Super-V on his return, Chuck's comment was, "What for... to wash it?"

Around-the-world flight, Honolulu to Honolulu, October 15 to 24, 1960

Proven performance and rugged dependability are only two of the outstanding features of the Super-V. You also get the greatest light twin value in aviation history in speed... range... price. It's unbeatable in its class in get-up-and-go at $22,500 firm price for basic conversion of your plane... with new plane certification. Conversions available *now* to present Bonanza owners... converted airframe also available to new buyers.

See the Super-V for yourself... fly one today at Bay Aviation Services or contact the distributor nearest you. Ask him for the new brochure giving the complete performance story, or write for yours now. Fleet Manufacturing, Ltd., 200 Bay St., Toronto... Central American Airways, Bowman Field, Louisville... Van's Air Service, Inc., Truax Airport, Madison... Southland Aviation, Hope, Arkansas... Bay Aviation Services Co., International Airport, Oakland.

BAY AVIATION SERVICES COMPANY

(formerly Oakland Airmotive)

INTERNATIONAL AIRPORT
SAN FRANCISCO OAKLAND

SUPER

Atlantic Gulfstream

(Continued from page 43)

receivers (ILS), and one 51Z-2 dual three-light marker beacon receiver.

The AP-103 autopilot was the very latest available; it was certificated on September 15, 1960. It automatically maintains a selected rate of turn, acquires and maintains a selected magnetic compass heading, or a selected radio (VOR or ILS) course, maintains crosswind corrections in all functions, selects a new VOR course at any time under radio command, has approach coupler to localizer and glide slope, and holds a selected pitch attitude.

In addition to the above, the AP-103 utilizes airspeed indications to select a control response sensitivity to provide a smooth ride at all speeds. The autopilot receives its signals from the pilot's flight director system.

The FD-105 flight director system makes manual flying of the airplane under instrument conditions a simple process. All that is necessary to maintain a selected course or heading is to keep the vertical bar centered on the flight indicator. If a new course or heading is selected, the bar will move off full scale. Centering the vertical bar with the aircraft's controls selects a pre-set bank, maintains a turn to the new course or heading and initiates the rollout at the proper time. Glide slope or altitude control is accomplished as simply by maintaining a horizontal indicator on the left side of the flight director horizon aligned with the horizon bar.

The Rolls-Royce Dart R. Da. 7/2 engines which power the Gulfstream have established an enviable record of longevity and reliability. They produce 2,190 eshp at 15,000 rpm and are presently reaching 1,600 hours between overhauls; but they eventually need an overhaul and this presents a problem to the operators--what to do for an engine while yours is being overhauled? There is no stockpile of Dart engines to draw from; thus one solution would be to purchase a spare engine--it costs $73,000 bare; ready to hang on the Gulfstream it approaches $90,000.

Atlantic saw the need for a realistic system which would preclude the necessity for the operator to purchase a spare engine and yet provide for a minimum down time. Basically the "loaner" plan is a membership arrangement. A $500 membership fee is required; a five-year contract is drawn. Dues are $725 per month for the first 36 months and $250 per month for the remaining 24 months. This places the total cost of membership for the five-year period at $32,600. For this, Atlantic provides one in-commission engine, ready to install, for each five members. The engines are "power packages" and can be changed in one day; thus if the change is scheduled with a periodic, no additional down time will be required. The cost of operation for the rental engine is set at $30 per hour with overhauls on the Dart averaging approximately $13,500. One specific advantage of the plan is that you get your own engine back--you benefit in reduced overhaul costs if your maintenance and operations have been conducted with the proper care.

Atlantic claims the cost of the plan is only slightly greater than the interest on the money necessary to finance your own spare engine. Airwork Corp. does the overhaul.

Frank Guididas and Robert Whempner brought the demonstrator to Teterboro for the flight. Kenneth Spinney, Atlantic's Gulfstream sales, and five additional passengers were aboard. The airplane grossed at near 30,000 lbs.; maximum gross, 33,600 lbs.

THE first thing you notice about a turboprop airplane as it taxies into the line is the loud squeal of the propellers and engines; the Gulfstream is no exception.

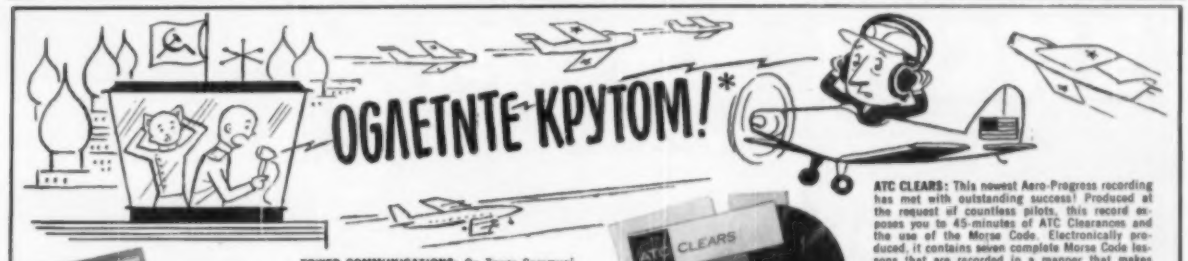
Once inside with the engines running, however, the noise level is quite comfortable although noticeably higher in the flight station than in the main cabin; voices have to be raised in the cockpit.

Taxiing over the uneven surface at Teterboro showed a stiffer than average landing gear, but the ride was quite comfortable. Steering is by a "tiller bar" to the left of the pilot. Sea level pressure this day was 29.78 in.: the temperature was 75 deg. F.

After a review of the checklist, the plane was ready for takeoff. Idle is 11,000 rpm; takeoff power is 15,000; acceleration was rapid but not unusual. The aircraft was rotated at just over 100 kts. and the initial climb speed was 2,000 fpm. As the airspeed built to 140 kts., the vertical speed reduced to 1,500 fpm; this further dropped to 1,200 fpm as we approached 10,000 feet.

Level-off was at 10,500 feet and cruising power of 14,200 rpm was established; tur-

(Continued on page 100)



TOWER COMMUNICATIONS: On Tower Communications you are taught the basic use of aircraft radio, the language of traffic control operators, the use of Direction Finding equipment, explanation of transceivers, frequencies, how to read radio listings, and all those radio aids so essential to safe flying. Recorded in the air by ATR pilots, you learn radio use as it happens—in the air! There's even a lost aircraft problem. An illustrated 20-page manual accompanies each album with diagrams, charts, photos and evaluation of equipment. A 33⅓ rpm, Hi-Fi, L.P., pure vinyl album.

ON COURSE, ON THE GLIDE PATH: This specially prepared album is so real—so true that you know you're in the pilot's seat as you come in for a ground controlled radar approach at the Los Angeles International Airport. This recording details to you the proper use of ground, tower and approach controls. You learn to use, as well as hear, all the radio aids to navigation. Included with each album is an illustrated, detailed brochure which explains marker beacons, omniranges, L.F. ranges, fan markers, compass locators, ILS components and all radio navigational aids. A 33⅓ rpm, Hi-Fi, L.P., pure vinyl album.

BUSTER B-T: This is a little novelty record, 33⅓ rpm, extended play, that just had to be made. From the book, "Buster B-T", Aero-Progress has made an adventure-filled record that gives an airplane "life". "Buster B-T" has adventures on the ground and in the air and meets and talks to 25 different types of planes. These planes come to life and assume character. You hear "Buster" talk to a pogo plane, a jet, a flying boat and 22 other types of planes. It's exciting! Narrated by Larry Harmon, the voice of Bozo the Clown, this wonderful record is welcome in any household. A 24-page beautifully illustrated, full color story book is available at $1.50.

ATC CLEARS: This newest Aero-Progress recording has met with outstanding success! Produced at the request of countless pilots, this record exposes you to 45-minutes of ATC Clearances and the use of the Morse Code. Electronically produced, it contains seven complete Morse Code lessons that are recorded in a manner that makes learning very easy and at the same time pleasurable. The reverse side gives 45 minutes of ATC Clearances, progressing from the simple to the complex. Included with the album is an IFR chart with space to permit working each clearance and a complete guide to ATC shorthand. A printed copy of each Morse Code lesson is also included. A 33⅓ rpm, Hi-Fi, L.P., pure vinyl album.

INSTRUMENT FLIGHT: This album has proved to be the most popular ever produced by Aero-Progress. The real heart of instrument flying is detailed to you quickly and easily. The story of IFR flying becomes simple to understand as you listen to this recording. You experience a complete IFR flight from Los Angeles to San Francisco—including experiences in preflight weather briefing, flight planning and complete enroute communications. A manual showing flight plans, logs and computations as well as photographs of omni, ADF and ILS needle displacements are also shown. Jeppesen Radio Navigation charts and a specially prepared manual are also included. A 33⅓ rpm, Hi-Fi, L.P., pure vinyl album.

DEALERS AND DISTRIBUTORS INQUIRIES INVITED

AIRMAIL REACHES US OVERNIGHT

AERO-PROGRESS, INC. DEPT. F-11
10493 Santa Monica Blvd., Los Angeles 25, Calif.
Please find enclosed $ ..... for the following:
.... TOWER COMMUNICATIONS @ $5.98 ea.
.... INSTRUMENT FLIGHT @ $5.98 ea.
.... ON COURSE, ON THE GLIDE PATH @ $5.98 ea.
.... ATC CLEARS @ $5.98 ea.
.... BUSTER B-T @ $1.00 ea.
.... Illustrated Book @ $1.50 ea.
.... for each record on tape at 3¾" /s add $2.00.
Please enclose 25¢ to cover postage and handling.
California residents add 4% sales tax.

Name _____
Address _____
City _____ Zone _____ State _____

*TRANSLATION SAME IN ALL LANGUAGES..."GO AROUND"

Send FLYING Every Month

name

address

city zone state

Check one: ☐ 3 years for **$12**
☐ 2 years for **$9**
☐ 1 year for **$5**

In the U. S., its possessions and Canada

☐ Payment enclosed ☐ Bill me

Foreign rates: Pan American Union countries, add 50¢ per year; all other foreign countries, add $1.00 per year.

Mail to: FLYING, Dept. F-161H
434 S. WABASH AVE., CHICAGO 5, ILL.

PREPARE NOW FOR YOUR
SPACE AGE CAREER
AT THE
ACADEMY of AERONAUTICS
Founded 1932

★ DESIGN TOMORROW'S JET & ATOMIC AIRCRAFT
★ DEVELOP ELECTRONIC SYSTEMS FOR SPACE TRAVEL
★ DIRECT AIRLINE MAINTENANCE OPERATIONS
★ PLAN & SUPERVISE PRODUCTION TECHNIQUES

Classes start March and September

Write Now for Bulletin 70 for Details

LA GUARDIA AIRPORT
FLUSHING 71, NEW YORK

HOW TO PUBLISH YOUR BOOK

Join our successful authors in a complete and reliable publishing program: publicity, advertising, handsome books. Speedy, efficient service. Send for **FREE** manuscript report & copy of **Publish Your Book.**

CARLTON PRESS Dept. FL 1
84 Fifth Ave., New York 11, N. Y.

(Continued from page 99)

bine gas temperature was 825 deg. F. and fuel consumption recorded at 875 lbs. per hour per engine. The indicated speed of 235 kts. trued out to approximately 285 kts. or 325 mph.

At 10,500 feet altitude the cabin was at sea level pressure; it maintains this pressure to 15,500 feet. It will maintain 2,200 feet cabin pressure to 20,000 feet, 5,500 feet to 25,000 feet and 8,000 to 30,000 feet altitude. The best altitude for cruise is considered to be between 22,000 and 24,000 feet although the airplane operates efficiently at all altitudes from 15,000 to 30,000 feet.

Grumman uses the main gear as a speed brake; it was extended at 10,500 feet and the nose lowered to well below the horizon. Vertical speed of 5,500 fpm resulted in an indicated airspeed of 280 kts. at idle power.

Pattern airspeed was 130 kts. indicated and final approach was at 115 kts. The plane came across the end of the runway at 100 kts.; there was no float, and the landing was sudden and solid. Deceleration was rapid despite the absence of reverse; the blades go into flat pitch and produce a high drag condition.

That Atlantic's new marketing concept is meeting with acceptance is evidenced by its sales so far; among the purchasers are: Minnesota's Triple M, Owens Corning Fiber Glass, Texaco, Owens Illinois Glass Co., Youngstown Steel and Tube Co., and others. So far 20 aircraft have been sold.

You may purchase an airplane identical to N285AA or you may have any color combination, equipment setup or custom arrangement you desire. Since FLYING's evaluation, the demonstrator itself was sold to Burlington Mills. The airplane shell costs $896,000; the average cost of electronics gear compatible with this class airplane to place it in the all-weather category runs around $130,000 to $140,000, and the interior similar to the demonstrator airplane will cost approximately $50,000 to $60,000. The final package will level out just short of $1,100,000.

For this, you get one of the very finest, most well-equipped business aircraft in the world today. END

A Lt. Named Christian

(Continued from page 66)

that, I can guarantee that in six months you're not going to be secon' lieutenants. You're going to be airman basics clippin' grass on that lawn outside. Do you understand?"

"Yes, Sir!"

I had forgotten that meeting as the lean, blackhaired lieutenant briefed me for our flight, and he was his quiet, smooth, lightly humorous self. He was even reassuring. "Lt. Jacobs tells me that you're doin' pretty well," he smiled at me.

I missed the barb (in Lt. Christian's book no cadet ever does well) and smiled back. "I hope so, sir."

He was a cheery, likable fellow as we walked to our airplane, asking me where my hometown was, how did I like the T-33; kind thoughts that put me even more at ease. I resolved to please him this flight, and checked the airplane and strapped into my shoulder harness, safety belt, and flame-streaked white crash helmet as quickly as I could. He was strapped into the back seat of the twin-seat trainer before I had even buckled my parachute and called, "Hurry up, Mistah Bok."

He said "Hurry it up, Mistah Bok" three more times before I pressed the starter switch to START. "Expedite your taxi, Mistah Bok, we're late already," he said as we taxied, and the needle of the airspeed, which doesn't even tremble until the airplane reaches 35 kts., moved off its peg.

I was vaguely uneasy; I sensed a change coming over the calm, cheerful instructor as we prepared for takeoff. I wasn't sure of the change until we were airborne with the landing gear tucked neatly away and I had begun a left turn out of traffic. "What are you doin'?" came a strange hard voice from the back seat.

I was shocked by the change in his voice. "Turning out of traffic, sir," I said.

"You call that a turn, Mistah Bok?" The airspeed was steady at 270 kts. when he took the controls from me without warning. The stick slammed hard back to the left, the plane jolted into a 90-degree bank, and the world around me went gray.

"When you want to turn the airplane," he rasped over the interphone, "turn it!"

"Yessir," I said. He made comments about my pussycat flying until we began our air work at altitude; then he began making remarks about my pussycat personality. My bank wasn't steep enough in the lazy eight. I didn't get the nose high enough in the chandelle. My turning stalls weren't sharp enough.

I can hear him so clearly today I remember every word he burned into me three years ago. "What are you up in that front seat, a 40-poun' rabbit? Fly this airplane, Mistah Bok, fly it!" My aileron rolls were wishy-washy. "Don't you like to fly, Mistah Bok?" he asked in despair. "Take that stick and hold it full over until I tell you to let go of it!" I was getting angry. I had never had trouble with acrobatics before, and I didn't feel I was doing so bad a job today. It was with fierce animal satisfaction that I held the stick over and we rolled and rolled and rolled. "The other way now, Mistah Bok." We rolled and rolled and rolled the other way. "Now a loop, Mistah Bok."

THIS was where I'd show him. If I could do nothing else in the T-33, I could loop it. Almost invariably I hit my slipstream at the bottom of loop, one sign of perfect performance. I dove the airplane to get the required 350 kts. and pulled the stick back until the needle of the accelerometer just touched the mark showing three Gs. Over the top we went, and I made a slight correction with the rudder to keep a straight path down our ground reference line. It was a good loop. The plane shuddered once as it hit the slipstream, and I allowed myself a smile. "You call that a loop?" came the hard voice from behind me.

"You're darn right I call that a loop, you idiot! I'd like to see you do one as good!"

I thought. "Yessir," I said.

"I don't call that a loop," he sneered. "I call that a big egg in the sky." He had the controls again, and the airspeed shot up to 350 kts. "This is what I call a loop."

I blacked out when the accelerometer needle touched five Gs, was conscious for a moment while we were inverted at the top of his loop, and blacked out again when we came around the bottom, thudding into the slipstream. "Now let's see you do one."

I let the airspeed go to 360 and furiously yanked back on the stick. Everything went dark, but I could still feel the stick and kept pulling back on it. When I could see again, we had finished the loop and were climbing slightly into the blue sky.

"That's a little better," came from the back seat. It was scant praise and short-lived. He didn't like my barrel rolls, he didn't like my Cuban eights, he didn't like my Immelmans.

In 40 minutes I heard more abuse and corrosive comments about my person and my flying than I had heard since I reported to preflight training, 10 months earlier. But fuel doesn't last forever, and the time finally came to fly home.

My turns into the traffic pattern weren't sharp enough, and Lt. Christian demonstrated how they should be done. As he demonstrated the first turn, the canopy cracked hard against my helmet and suddenly it was very quiet from the back seat. The interphone was dead. I was happy, I was overjoyed as he twisted the airplane on into the pattern. "You're the worst instructor I've ever flown with," I said to the dead microphone. "You are out of your mind if you think anybody can learn anything from flying with you. You're lucky some cadet hasn't flown straight into the ground just to stop your screaming from the back seat."

We were turning onto initial approach, and I was enjoying the dead microphone to the hilt. "You poor excuse for an instructor, you miserable . . ."

"ARE you flying this airplane, Mistah Bok?" The grating voice was loud in my earphone, and I went cold. I had just washed myself out of the Aviation Cadet program. I could see the court-martial board now and the verdict: guilty of highest disrespect for an officer . . . "Are you flying this airplane, Mistah Bok?" He wasn't calling on the interphone. He was transmitting on the UHF radio, and every other T-33 in the sky heard him call. The interphone between us was still safely dead. In reply I slammed the stick hard over in a pitchout above the end of the runway. I jolted the wings level and slammed the landing gear handle down. I smashed the flap lever back and racked the airplane around onto final approach. I leveled off a foot above the runway and 10,000 pounds of jet trainer crashed to the concrete.

We taxied back, interphone out, not speaking. I shut the engine down and ripped out of my harness. It was very hard to stay calm as I watched him climb out of the plane. "If he calls me one more name," I steamed to myself, "just one more name, I'll lay him out!" I doubt that I really would have struck Lt. Christian, but my fist was very tightly clenched when he spoke.

"Pretty good flight, Mistah Bok," he said, smiling.

I choked. "I got the impression you weren't too pleased with it, sir."

"What's the matter? Can't you take a little ol' fashion instructor-talk? You're not getting to be sensitive, are you Mistah Bok?"

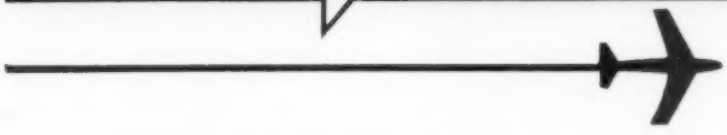
"No, sir."

The grade slip he filled out for the flight was marked average. The column under below-average was checked next to Lazy Eight, and next to Loop was an above-average check. I wondered for a moment what kind of flight it took to earn any more below-averages.

That was Lt. Christian. That was the only time I flew with him, and I discovered that most of the rest of my class had only flown with him one time. He left our base just before we graduated with the silver wings he had made us work so very hard to earn.

I don't know if the Air Force deliberately keeps an old-time tiger-instructor like Lt. Christian on the training bases to show cadets what it was like in the good old days and give them a first-hand view of Air Force history and traditions. I do know that if I were training pilots, though, and I wanted the best men with the highest esprit de corps' of any flying unit in the world, I'd take a man like First Lieutenant Robert Christian and tell him to fly once, just once, with every cadet in my Air Force. END

PILOTS MAKE MORE MONEY



The surest way to higher income, in a hurry, is through additional type ratings. Qualify for one or more of these, and you insure your future in aviation.

American Flyers, the nation's leading flight training school, is geared to give you top notch instruction at an accelerated pace — saving both your time and money. Write or call today!

- **Free placement service**
- **Two locations, Fort Worth and Ardmore, Oklahoma**
- **Convenient accommodations**
- **Complete ground school and flight school**
- **Close personal attention from top instructors**
- **FAA approved school #2343**
- **Approved for Veteran's Training**
- **Courses start every Monday — no waiting**

"The Airline Pilots Training School"

AMERICAN FLYERS INCORPORATED

Meacham Field • Fort Worth 6, Texas
Ardmore Airpark • Ardmore, Oklahoma

MAIL THIS COUPON TODAY

☐ INSTRUMENT
☐ AIRLINE TRANSPORT
☐ COMMERCIAL
☐ TYPE RATING
☐ COMPANY PILOT
☐ MULTI-ENGINE
☐ INSTRUCTOR

REED PIGMAN, AMERICAN FLYERS, Dept. 10
Meacham Field, Fort Worth 6, Texas
Please send me FREE booklet and data on courses checked.
NAME_____
ADDRESS_____
CITY_____ STATE_____
☐ VETERAN ☐ CIVILIAN
AGE_____ HOURS LOGGED_____

NOW AVAILABLE!

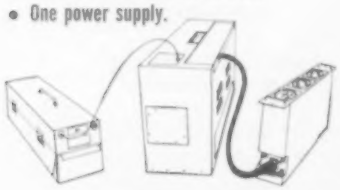
A Portable Emergency Communications and Navigation unit!

the ELECTALIFE!

Power failure and non-operational radio equipment will no longer be a cause for concern if your plane carries Electalife.

Excellent for ferrying operations.

- 26 lbs.
- 28VDC Integral charging from any 115 volt line.
- Aluminum cased.
- Up to 2 hours dependable operation.
- Communications and Navigation unit removeable for placement in easy operating position.
- Self storing cables, microphones, and headphones.
- One 90 channel VHF transmitter.
- One 190 Channel VHF communication and Navigation Receiver.
- One VOR Instrumentation Unit.
- One power supply.



SPARTAN

AIRCRAFT COMPANY
AVIATION SERVICE DIVISION
MUNICIPAL AIRPORT • TULSA, OKLA.

N35 Bonanza

(Continued from page 41)

This new arrangement, however, has provided a safety action that prevents this from happening. Jim Bir, assistant manager of Bonanza sales, demonstrated this by turning the key to the start position after we were fired up. I winced, but it worked. No damage done.

After takeoff we started making timed runs against the section lines. The temperature was 23 degrees C. Wind was out of the south-southeast at 15 mp'i. Full tanks and three passengers put us only slightly under gross weight. Our first power setting was 75 per cent with 24.5 inches of mp and 2,450 rpm.

The air at 1,500 feet was as choppy as a country road and as nearly as I could tell the indicated speed held closest to 175 mph. The average of runs in all four directions was 20 seconds a mile, or a timed speed of 180 mph. Correcting our IAS for altitude and temperature gave us a true airspeed of 183 mph.

We repeated the same procedure with a throttle setting of 55 per cent of power—at 21 inches of mp and 2,300 rpm. In this case our IAS was 155 mph, our timed speed turned out to be 164 mph, and our TAS 162 mph.

Climb runs occupied us next and, as in many modern airplanes, it became immediately apparent that maximum climbs are much too steep for comfort or safety. The rate of climb showed a strong 1,300 fpm, which indicated Beech's 1,150 fpm at gross should be attainable by most pilots.

We then ascended from a field elevation of 1,160 feet to 10,000 feet. Climb speed was held at 135 mph to 6,000 feet and 130 mph from there on top. This 8,840-foot climb was made in 14 minutes and 54 seconds for an average just over 600 fpm. In this time we covered a little more than 42 miles. It becomes apparent that this is the way most owners are going to climb to altitude on their cross-country trips.

At 10,000 feet the outside air temperature was five degrees C. With 2,500 rpm and 20.4 inches we pulled a shade under 65 per cent power. The airspeed stabilized at 163 mph, which trued out to 194 mph or four mph faster than the Beech specs call for. At 55 per cent power the IAS was 152 or 177 mph true, which is mighty close to the 175 mph Beech says the plane will do.

Beech specs, by the way, are based on flight testing done with a full complement of antennas, plus equipment that usually gets hung on the airplane after purchase. As Bir put it, "We want the airplane to perform as the owner is going to fly it. We think he'll be far more satisfied if he equals or surpasses our published performance than if he falls short of those figures."

On the way down, I lowered the gear and trimmed out to 100 mph. Beech calls for this if you get into an emergency on instruments and need some help. With hands off, the airplane slowly turned to the right. As we went down, down, down, the bank got as high as 60 degrees but never exceeded this limit, the nose dropped way down, but surprisingly enough the airspeed never went above 130 mph.

The innate stability of this airplane could get the pilot out of a jam. Incidentally, on this year's model the gear has been designed to be lowered at speeds up to 200 mph in an emergency. The doors may be bent, but no damage will be done to the gear.

Stalls were normal in every respect. With gear and flaps down, we got an indicated stall speed of 57 mph, which is mighty close to the 60 mph which Beech calls for at gross weight. With gear and flaps up the stall speed is about 10 mph higher.

Landings in this airplane are a real pleasure. A final approach at 80 mph gives an attitude that is not too much nose down and plenty of elevator power for good flare. Carrying a little power brings the nose up a bit, slows down the rate of sink and makes for real easy and accurate approaches.

While it's difficult to make comparisons without flying both airplanes in immediate succession, I believe the N35 has lighter, more pleasant control pressures than recent Bonanza models. With the higher-powered engine, there might be just a shade more noise and vibration. But there's no doubt that this is a very desirable piece of machinery that will take you far and fast in a great deal of comfort. END

BEECHCRAFT N35 BONANZA

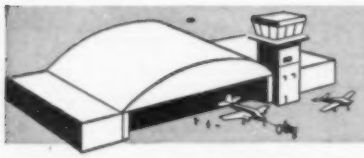
Specifications:

Gross weight	3,125 lbs.
*Empty weight	1,855 lbs.
*Useful load	1,270 lbs.
Wingspan	33 ft. 5.5 in.
Length	25 ft. 2 in.
Height	6 ft. 6.5 in.
Wing area	181.0 sq. ft.
Wing loading (gross weight)	17.3 lbs./sq. ft.
Power loading (gross weight)	12.0 lbs./hp
Cabin length	8 ft. 11 in.
Cabin width	3 ft. 6 in.
Cabin height	4 ft. 2 in.
Glass area	28 sq. ft.
Baggage capacity (16.5 cu. ft.)	270 lbs.
Fuel capacity (standard)	50 gals.
Fuel capacity (optional tanks)	80 gals.
Oil capacity	10 qts.

* (Optional five-place aircraft has empty weight of 1,872 lbs. and useful load of 1,253 lbs.)

Performance:

Cruising speeds:	
at 75% power (7,000 ft.)	195 mph
at 65% power (10,000 ft.)	190 mph
at 45% power (10,000 ft.)	159 mph
Top speed (sea level)	205 mph
Range, 45% power, 10,000 ft. (45 min. reserve):	
Standard fuel (50 gals.)	690 mi.
Optional fuel (80 gals.)	1,215 mi.
Rate of climb (sea level)	1,150 fpm.
Service ceiling	19,200 ft.
Absolute ceiling	21,000 ft.
Stall speed (power off):	
Gear & flaps extended (30 deg.)	60 mph
Gear & flaps up	71 mph
Takeoff distance (20 deg. flaps, sea level, 10 mph wind, standard temp.)	
Ground run	745 ft.
Total over 50 ft. obstacle	1,050 ft.
Landing distance (30 deg. flaps, sea level, zero wind, standard temp.)	
Ground run	505 ft.
Total over 50 ft. obstacle	1,130 ft.



AVIATION MARKET PLACE

NOTICE: Rates, 50c per word. Minimum 10 words. March Issue Closes January 10th. Send order and remittance to Martin Lincoln, FLYING, One Park Ave., N.Y.C. 16.

AIRPLANES FOR SALE

AERO COMMANDER

18 from $26,000. 1959 Model 500, ≠PXZG/BF, has 375 hours. LF. Narco Sapphire 360 channel VHF transceiver. ARC-15D omnirange. ARC-21A ADF. Many extras. Bargain. $54,000. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting".

BEECH

BONANZA k-35, 240 hours total time on frame. New engine, 44 hours. Color red, white, blue. New A.D.F. 12 E 2 Tact Air, T-3, Auto Pilot, dual wheel, headrests, cagel disc brakes, all 6 months old. Air conditioning, sound proof, drapes, aux tanks, 50 amp. generator, full panel. One owner, never damaged, always hangared, rotating beacon. Will accept reasonable offer. R. C. Dickey, 4312 So. Illinois St., Streator, Ill.

D-18S Beechcraft. 1946, model, hydromatics, New de-icers, 80 gallon nose tank, Dare transceiver and ADF, ARC omni, etc. Very clean inside and out. Wire, write, or call. H. J. Bailey, GPL Division—General Precision, Inc. Pleasantville, N. Y. ROgers 9-5000.

1957 H-Model Bonanza beautiful yellow and white, always hangared three radios $14,500 T3 autopilot and dual omni available at reduced price. Robert C. Warner, 2826 Eaton, Denver, Colorado.

BONANZAS: 39 from $7100. 1955, F-35, 225HP, ≠GGRG/CF, has 570 hours. Autopitch control metal propeller. Auxiliary tank. Rotating beacon. Gyros. LF. VHF. Omnirange. ADF-12D. Hangared. Undamaged. Relicensed October. Best condition. Beautiful. Bargain. $11,500. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting".

TRAVELAIRS: From $40,900. 1959, ≠PRF/QF, has 202 hours. Auxiliary tanks. Gyros. Narco 90 channel VHF transceiver. ADF-12E. L-2 DeLuxe auto-pilot. Extras. Hangared. Undamaged. Relicensed September. Like new. $45,000. Make offer. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting".

CESSNA

CESSNA 175, 1958, 700 hrs. TT, 250 hrs. on new engine, undamaged, always hangared, full vacuum panel, Collins 90/190 transceiver w.th omni, ASL, Superhomer, Beacon, New Tires $9650.00 or without Collins $8290.00. Warren Anderson, P.O. Box 684, Bloomington, Ill.

1960 Model Cessna Skylane 220 total hours, full panel, Mark II, head rests, tilting seat, like new $14,500.00. Lloyd Hawkins, Dudley 3-2777, Edinburg, Texas.

172'S: 19 from $6,200. 1956, ≠PJJQ/AF, has 420 total hours. Gyros. VHF. Omnigator. ADF-12. Completely repainted May. Beautiful. Hangared. Undamaged, $7500. Make offer. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting".

175'S: 11 available. 1958, ≠JGGR/MF, has 420 hours. Rotating beacon. Gyros. Mark 2 Omnigator. ADF. Hangared. Clean. Relicensed August. $8325. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting".

182'S, Skylanes. 20 from $8000. Painted, 1958 Skylane, ≠FZGR/DF, has 575 hours. Rotating beacon. Gyros. LF. Mark 2 Omnigator. Extras. Hangared. Undamaged. Beautiful. One pilot. Bargain. $10,500. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting".

TWIN 310'S: 12 from $49,000. 1960, model 310D, ≠PJGJ, has 117 hours. Dual Narco Mark 5 VHF 90 channel transceivers with omnis. ADF-12. Oxygen. Extras. Like new. $59,000. Make offer. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting".

GRUMMAN

ALL Amphibious Models: Goose, ≠GPTX/F, has 150 hours SMOH. 8 place. Rotating beacon. Dual blind panels. LF. Dual Mark 2, ARC-15D, omnirange. Dual Dare VHF transmitters. ADF. Fabric excellent. No corrosion. Clean. Extras. Improvements. $40,000. Make offer. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting".

HELIO

COURIERS: 8 from $12,000. 1957, 260 HP, ≠TGGJ/RF, has 302 total hours. Crosswind gear. DeLuxe gyro panel. LF. VHF transceiver. ADF-12E. Repainted November. Undamaged. All bulletins. Bargain. $13,600. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting".

NAVION

33 from $4400. Twin Riley 150 HP, ≠FZGX/K, has 363 hours since converted. Engines 55 hours SMOH. Rotating beacon. Gyro panel. Mark 2 Omnigator. Adf-12. Complete L-2 auto-pilot. Relicensed October. Bargain. $12,650. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting".

PIPER

APACHES: 21 from $15,100. 1959, ≠FQGT/PF, has 550 total hours. 220 SMOH. 5 place. Rotating beacon. 90 channel Mark 5 VHF transceiver. Mark 2 Omnigator. ADF-12E. Top condition. Bargain. $24,700. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting".

TRI-PACERS: 36 from $4000. 1957, ≠JPRJ/DF, has 488 hours. Auxiliary tank. Gyros. 12 channel VHF Superhomer omnirange transceiver. LF. Hangared. Undamaged. Beautiful. $5750. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting".

ROYAL GULL

TOTAL time airframe, engineer 237 hours. Full panel. Lear LVTR-36 VHF trans.-Rec. 2 Lear 14C A.D.F. ARC 15D. Omni—ARC R-20. Marker Beacon Receiver—Sunair S22RTR HF Trans. Rec. ARC F11-A, isolation amplifier. Aircraft always hangared and maintained in A-1 condition. Make offers to: Director of Air Services, Department of Transportation & Communications, Quebec Airport, Ancienne Lorette, P.Q.

SUPERIOR

SUPERIOR Satellite, Americas most stable, fastest modern 2 place. 88 hrs. since factory new. Loaded. $6000, $1500 down. Write 2213 Huron Drive, Concord, Calif.

AIRPLANES MISCELLANEOUS

SAVE hundreds of dollars. It's New! Now you can receive information each month on hundreds of aircraft for sale throughout the United States. At a glance you will know what is available, hours, date licensed, price, etc., of practically every type of airplane manufactured. We tell you who owns the aircraft and you deal direct, saving time, eliminating hours of travel, and by knowing the market you get the best deal possible. You can receive your first copy listing aircraft for sale immediately. Don't wait! Send $2.00 for an eight month subscription. Flyers Market, published by Aircraft Listing Bureau, 5305 W. Congress Pkwy., Chicago 44, Ill.

GOVERNMENT surplus aircraft, jeeps, boats, etc. Buy direct. Depot list, procedure. $1.00, included Free: "Directory of Industrial Surplus Bargains." Preston-Clarke Publications, Holtsville 25, N. Y.

LARGE Stocks Used Aircraft For Sale—Piper Apaches, Comanches, Tri-Pacers, Super Cubs, also Cessnas, Beechcrafts. Trade, Lease, Finance, Export. Delaware Aviation, North Philadelphia Airport, Philadelphia, Pennsylvania—HObart 4-1600.

POWERS & GEORGE, Aircraft Brokers, 475 Fifth Avenue, New York 17, N. Y., have hundreds of listings of practically all U. S. civil aircraft for sale from $3500. Check these before buying. "Exporting".

AIRPLANES WANTED

SINCE 1947, Powers & George, Aircraft Brokers, 475 Fifth Avenue, New York 17, N. Y., have sold hundreds of airplanes from $3500 worldwide for owners. List yours free, non-exclusively. "Exporting".

HELICOPTERS

HOMEBUILT designer booklet. 16 pages explanations; information, $1.00. Homebuilt airplane directory. 16 pages photographs, specifications, $1.00. Money back guarantee. Sam Urshan, 4332 N.P. Station, San Diego 4, California.

HELICOPTER business, training and employment opportunities. Details free. Aviation Service, Holtsville, 13, N. Y.

HELICOPTERS are our business, not our sideline. A-W originators of homebuilt helicopters (not autogyros) sells more kits, plans than all others combined. Learn why! Booklet with 3-view drawings, complete prices, regulations, specifications, photos sent postpaid, 25c. Adams-Wilson Helicopters, Lakewood 13, California.

EQUIPMENT, PARTS AND ACCESSORIES

NEW Mark VIII-C improved Dead Reckoning Computer with instructions, pocket size $2.00; New E-11 pocket size high speed, high Altitude Computer $5.00; "Batori Pilot's all metal Computer" $15.00; Pressure Pattern Drift, $2.50; Pressure Pattern Plotter $3.00; New E-6B, $10.00; Air Force Jet Pocket Computer, MK-2 Navy Knee Clipboard $10.00. Free Catalogue. Pan American Navigation Service, 12021-8 Ventura Blvd., N. Hollywood, Calif.

LARGEST stock in the U. S. of New, Used, and Overhauled engines, propellers, accessories and airframe parts. Free lists by makes. Univair, Dept. D, Box 5306, Denver, Colorado.

LATE Model Narco VHT-3B 12 Crystals. Factory New $225 and your old 4 channel. Late Model Mark 2B, 27 Crystals $450 and your old Conigator or $500 and your old VHT-3. 4 Channel Superhomers $295. 12 Channel Superhomers $350. Trade your old LF and $805 on New Lear or Narco ADF. Crystals $4.50 each. Write for quotes on Collins, ARC, King, Motorola, Narco, Etc. Guarantee with all sets new or used. Radio Distributors, Urschel Field, Valparaiso, Indiana.

ADVANCED ground effect machine—five views—technical data included. $4.00. G.E.M. Thrust, P.O. Box 121, Metairie, Louisiana.

DON'T Be Caught With Your Power Down When You Need It. Be safe and sure with the new, "all new" VHF Transmitter and Receiver by Lee Air. The powerful little 5 watt unit has a tunable receiver, from 108 to 128 Mc., 23 channel, with three crystals, all cables, antenna, and transistorized low drain power supply. Either Inp 505B price: $289.50. Also our Omni, Pathfinder 100, fully transistorized, 1 lb. 14 oz., standard instrument size. Price, $345.50. Lee Air Electronics, Inc., 845 W. 11th Street, Upland, Calif.

AVIATION BOOKS

FREE 1960 catalog of Aviation Books of all publishers. Aero Publishers, Inc., 2162 Sunset, Los Angeles 26, California.

AVIATION Books World War 1, 2, early aviation, send for lists stating interests. E. Peterson, 1590 East 22 St., Brooklyn 10, New York.

STUDENT Pilot's Flight Manual by Kershner. Most complete and up-to-date manual available. Covers all required maneuvers including new instrument training. Widely recommended by flight instructors. $2.95. Order from ISU Press, Ames, Iowa.

AVIATION—astronautics history. Books, magazines, pictures. World's leading specialist. Free catalog. Dept. F, Hampton Books, Hampton Bays, N. Y.

SCARCE Aviation Books, catalog. Beachcomber Bookshop, Rt. 1, Blaine, Wash.

LEARN L/F Radio navigation or your money back. Complete orientation course for student or professional includes 12" LP album and text, plus illustrated manual which shows your flight path and position at all times. Fly with confidence, order "L/F Radio Range Orientations" today. $7.50. Satisfaction guaranteed. Flight Line Specialties, Box 937-F2, Tulare, Cal.

WARNING—FAA examination is being changed: it takes more than questionnaires to prepare you for the new "open-book" FAA examinations. You need the text and background material that only the authoritative up-to-date Zweng Manuals provide. Used by aviation schools throughout the world. Fully illustrated, each manual averages more than 300 pages, with latest examination, too. There's a proven Zweng Manual for each rating: "Helicopter Rating," $5.00; "Commercial & Private Pilot Ratings," both for $4.00; "Instrument Rating," $5.00; "Airline Transport Pilot," $5.50; "Flight Instructor," $5.00; "Flight Engineer," $5.00; "Aircraft Dispatcher," $5.00; "Safety After Solo," new revision, $4.75; "Parachute Technician," $3.00; "Aircraft & Engine Mechanics," (including hydraulics, weight & balance) and new "Electrical Examination," $5.00; "Manual of the E-6B Computer," $3.00; "Rules of the Air," indexed, illustrated, $2.00; "Flying the Omnirange," $4.00; "Encyclopedic Aviation Dictionary, $6.00; "American Flight Navigator Deluxe Edition—examinations (Dohm)," $6.50; "Air Navigation," Gold Medal Edition (Weems) prepares for Navigator Rating, $6.00. We supply any book by other publishers, including: "Jet Aircraft Power Systems," $11.25; "Radio Operator's License," $6.60; "Practical Air Navigation" (Lyon) $3.00; "Von Richthofen and the Flying Circus," $6.50; "Crop Dusting" (6 manuals), $12.50; (Free Catalog), Pan American Navigation Service, 12021-8 Ventura Blvd., North Hollywood, Calif.

LIGHTPLANE design book, proven plans, $4.75. Brochure, dime. Wm. Fike, Box 683, Anchorage, Alaska.

LEARN L/F Radio range orientations in your spare time at home. Complete course on L/P record includes fully diagrammed text. Full price $7.50. Flight Line Specialties, Dept. F-1, P. O. Box 937, Tulare, California.

AVIATION Bargain Catalogue. Send One Dollar. Box 465, R.D. 1, Colt's Neck, N. J.

COMMUNICATION EQUIPMENT

OVER 200 radios in stock. Guarantee with all sets new or used. Collins, Lear, ARC, Narco, King, etc., Radio Distributors, Urschel Field, Valparaiso, Indiana. Phone HO 2-4188.

VHF Receivers, 118 to 135 mc or 108 to 127 mc., $49.95 post paid. Galtronics, 64-01 35 Ave., Woodside 77, N. Y.

NARCO Saphire 90 Guaranteed by our FAA Approved Shop. Complete mount head, harness and antenna $975. Radio Distributors, Urschel Field, Valparaiso, Indiana. Phone HO 2-4188.

MOTOROLA, Lear, ADF 12E new complete $625. Crystals $4.50 each. Radio Distributors, Urschel Field, Valparaiso, Indiana. HO 2-4188.

NARCO Unicom 122.8 complete with antenna, microphone, like new. Used only six months. Ship. anywhere C.O.D. $150.00. Lloyd Hawkins, Dudley 3-2777, Edinburg, Texas.

PARACHUTES

NEW Surplus Release, for Aircraft-Gliders. 28'—Thin Backs—Seats—Jet Types $75.00, Standard $65.00, Rebuilt $50.00. 26'—Extra Thin, Lightweight $100.00-$65.00. 24'—$50.00—Rebuilt $35.00. Sky Diving Sets—28' & 24'—Orange & White—Gores—Sleeves—Modifications—$85.00 up. F.A.A. approved—Fresh packed—Guaranteed—Export shipment. Midwest Parachute, Novi, Michigan.

AVIATION APPAREL

FLYING suits (K2B) and reversible jackets of survival orangé (visible 30,000 ft.) or sage green combed cotton byrd cloth twill. Includes personal leather name tab. Reversible jackets are orange one side, green other side. A must for every X-C pilot. State height, weight, chest size, and color preference. Reversible jackets $22.50. Orange suits $21.50. Sage green suits $19.50. Fruhauf Uniform, 312J East English, Wichita 2, Kansas.

PHOTOS

AVIATION Photo & Book Collectors! New lists of photos & books now available. Including Pioneer, WWI & II. Exclusive photos of Historical planes, latest jets. Send 25¢ for sample photo & book lists. Airbooks, P.O. Box 958, New Rochelle, N. Y.

AIRPLANE photographs, beautiful large 14x17 color reproductions. Decorate dens, etc. with war planes in action. Six assorted. Send $1.00. Jarvis, Box 2427F, Bostonia, Calif.

CHARTS and MAPS

WORLD coverage of all current aeronautical maps and charts. Agents for Coast & Geodetic Survey, Hydrographic Office Air Force. Free catalogue. Pan American Navigation Service, 12021-8 Ventura Blvd., N. Hollywood, Calif.

LOG BOOKS

STEELE'S Pilot Log $1.50; Pilot Flight Record Log $1.00; Senior Pilot Log $5.70; Flight Navigation Record (Deluxe) $5.70; Air Stewardess Log $2.00; Deluxe Navigator Log $5.70; Flight Engineer Log (Deluxe) $5.70; Aircraft Log $1.50; Engine Log $.70; Pilot Progress Rating Log $1.00; Parachute Rigger Log $1.50. (Free catalog.) Pan American Navigation Service, 12021-8 Ventura Blvd., North Hollywood, Calif.

INSTRUCTION

OPERATORS, Instructors, Schools: prepare your students for the top—with Zweng Manuals. Complete Texts, latest typical examinations. Free catalogue Aeronautical and Marine discount sheet. Pan American Navigation Service, 12021-8 Ventura Blvd., North Hollywood, Calif.

BUILD your own Airplane—Plans, kits, materials—Mignet, Jodel, Maranda, Tempete, Piel Emeraude, Fauvel, and others. Send dime for catalogue—Falconar Aircraft, Municipal Airport, Edmonton, Alberta, Canada.

BUILDING your own high performance sport plane is easy with our new simplified blueprints and detailed instructions. No experience required. Four economical models, one, two passenger, aerobatics. For complete details, brochures, photographs, 3-views, F.A.A. regulations on home-built airplanes, mail $1.00 (postal, packaging expense) to Stits Aircraft, Box 3084FC, Riverside, California.

DIRECTORY of over 800 aviation schools. Details free. Preston Clarke Publications, Holtsville 4, N. Y.

BUSINESS OPPORTUNITIES

AVIATION Operators: Many operators are increasing their income by stocking Zweng texts and general aviation supplies. Apply for a Dealership now. Pan American Navigation Service, 12021-8 Ventura Blvd., No. Hollywood, Calif. (Free Catalog.)

START your own aviation business with little capital. 84 opportunities. Details free. Aviation Service, Holtsville 1, N. Y.

$60.00 Weekly Spare Time acting as our representatives for complete line of Aviation Textbooks and Pilot accessories. Free details. Write Carlson Aviation, Box 5536-BA, Oklahoma City 10, Oklahoma.

HELP WANTED

NAMES, addresses—best aviation employment opportunities—Domestic, abroad. Send $1.00. Room 302, 41 E. Washington, Indianapolis, Ind.

AVIATION Jobs—names and addresses of companies to contact. $1.00. Fitzgerald Aviation Aids, Dept. A-1, 815 Countryside Drive, Wheaton, Illinois.

AIRCRAFT Mechanics—A & P and Sheetmetal Mechanics—experienced men in either field. Top rate paid. Apply Atlantic Aviation, Teterboro Airport, Teterboro, N. J. Attn. Bill Patrick.

AIRCRAFT Radio Technician—Experienced maintaining Communications and Navigations systems. Top rate paid. Apply Atlantic Aviation, Teterboro Airport, Teterboro, N. J. Attn. Bill Patrick.

HIGH Paying Aviation Jobs Now Open! Will rush details! Aviation Employment Information Service, Dept. F, Holtsville, N. Y.

BECOME a Crop Duster, top wages, free literature. Agricultural Aviation Academy, Minden, Nevada.

SALESMEN preferably with aircraft earn $1,000 per month selling aero products to Flight Schools in your area. Full or part time. Experience unnecessary. Kane Aero Co., 1845 Ford Parkway, St. Paul 16, Minn.

PILOTS! Mechanics! Need Employment? Nonprofit service send for application AEC, Minden, Nevada.

HIGH-PAYING Jobs Now Open! We will rush latest confidential reports on best employment opportunities (foreign, domestic, skilled, unskilled). Hundreds of aviation jobs now available! Also jobs in electronics, construction, shipping, oil, etc. Application forms. Free registration. One-year advisory service. All for $2.50 ($2.85 Airmail). Unconditional Money-Back Guarantee. Aviation Employment Information Service, Holtsville 7, N. Y. Six reports included Free: (1) Executive Flying; (2) Helicopter Opportunities; (3) Industrial Flying (crop-dusting, photography, patrolling, advertising); (4) Companies with Foreign Branches; (5) Alaskan Opportunities; (6) Directory of Airlines and Aircraft Manufacturers.

SITUATIONS WANTED

OPERATORS! Need qualified pilots mechanics? Free employment placement service. AEC, Minden, Nevada.

A.T.R. 10,000 current hours, high instrument time. Qualified Cessna through 707, desires corporation or airline flying position. U. S. preferred, consider foreign, Resume on request. Box 220, Flying, One Park Ave., New York 16, New York.

METAL CONVERSIONS

SKYCRAFT Design—Leader in All-Metal conversions. Over 1000 flying—Specializing in fast service for Ercoupe, Cessna 120, 140, 170, Stinson 108, Piper PA-16, 18, 20, 22, Bellanca. Free brochure (F-10). Call Al or Fred: TU 2-6400 or write Skycraft Design, Mercer County Airport, Box 67, West Trenton, New Jersey.

MISCELLANEOUS

". . . IN Radar Contact! Authentic, thrilling High Fidelity L.P. Recording by Capital Recording takes you on actual IFR flights with the professionals! Many ILS approaches into Newark and LaGuardia; ATC clearances from LaGuardia; New York Center; and many other interesting Features. Beautiful Album in Glossy Black with Two Tone Day Glo trim! RF 126, Terminal Area Charts, and postage included. Dealer inquiries invited. $5.95. Michael V. Kuntz, 453 Mount Prospect Avenue, Newark, New Jersey.

DON'T Get Lost! Keep x-country data in pocket-size log, with plastic cover $1.00. Ren-Avi-Aids, Box 633, Atlanta Airport, Atlanta 20, Georgia.

FLY Long Island-based Cessna 172s, 150, Aeronca with Allied Flyers. Your inquiry invited. Gambino, 40 Kime Avenue, North Babylon, New York (JU 6-7511 evenings).

HAVE your own instrument approach and watch the traffic increase at your field. F.C.C. Type Accepted Avtronics H facility, 50 watts, 200 to 500 KC. Ideal for corporations going into fields without navigational aids. We can install and license. Avtronics, Reed City, Mich. Phone TE 2-5777.

AIRCRAFT Owners—interested in selling? List your aircraft for nationwide circulation. Send all type listings to J. M. Kopp, P.O. Box 301, Rahway, N. J.

BUY War Surplus Direct from the Government—Jeeps; Trucks, Tractors; Boats; Airplanes; Helicopters; Walkie Talkies; Radar; Electronics; Misc.—Send for Brody's "U. S. Depot Directory & Procedures" $1.00. Box 425-(B) Nanuet, New York.

PROPELLER Clocks: Beautiful, Genuine Aircraft Propellers, 42" Long with Luminous Dial Electric Clock. Satisfaction Guaranteed $23.75. Postpaid. JEM, 1437 W. Euclid, Stockton 4, California.

FREE Discount Catalog. Aviation Supplies. Carlson's, Box 5536-B, Oklahoma City 10, Oklahoma.

BUILD your own Airplane Plans, kits, materials for Mignet, Jodel D-9, D-11, Maranda, Jurca Tempete, Piel Emeraude, Fauvel AV-36, and others. Send dime for catalogue. Falconar Aircraft, Municipal Airport, Edmonton, Alberta, Canada.

AOPA Wingers embossed in silver on black calf. Price also includes your name. 75¢ each. Also available with clutch fasteners making them removable for garment cleaning. Add 25¢. Write for free catalog. Ken Nolan, Inc., Dept. F, San Clemente, Calif.

USED "Aircraft Buyers" Guide. Inspection of: Fabric; Metal; Airframes; Component parts; Engines; Titles; Repair records; Trouble spots; Important tips that will save you money. Free details. Guide, Box 911, Shawnee, Oklahoma.

MEMBERSHIPS available. Long Island Flying Club based at Deer Park, Long Island. Flying a PA-12 Super Cruiser and a fully instrumented 170-B. Call Carl Stephens, president, at Flushing 7-5917, New York City.

HOMEBUILT Designer Booklet 16 pages explanation, information, $1.00. Homebuilt Airplane Directory. 16 pages photographs, specifications, $1.00. Money back guarantee, Sam Urshan, 4332 N.P. Station, San Diego 4, California.

HELP protect private flying. Write for free information. National Fight for Flight Inc., Box 464, Oak Hill, W. Va.

SHOPPING GUIDE
Classified

A handy reference to products and service not necessarily for aviation, but of wide general interest.

PHOTOGRAPHY—FILM, EQUIPMENT, SERVICES

OPTICAL—Science—Math Bargain—Request Free Giant catalog "CJ"—128 pages—Astronomical Telescopes, Microscopes, Lenses, Binoculars, Kits, Parts, Amazing war surplus bargains. Edmund Scientific Co., Barrington, New Jersey.

FREE every month—Blackhawk's newspaper-size catalog 8mm, 16mm movies, 2"x2" color slides. Biggest selection in U.S.A. Bargains in used 16mm. sound films, projectors. Blackhawk Films, Davenport 10, Iowa.

STAMPS & COINS

FREE! $1.00 worth, your choice, from first stamp selection. No strings! Adults only. Rush request now. Philatelics, Dept. EMG-F, New Paltz, N. Y.

OVER 210,000 buyers and sellers will read your ad when placed in this space. It costs only 50¢ per word: minimum of 10 words including your name and address.

GIGANTIC Collection Free! Includes triangles, early United States, animals, commemoratives, British Colonies, high value pictorials, etc. Complete collection plus big illustrated magazine all free. Send 5¢ for postage. Gray Stamp Company, Dept. Z2, Toronto, Canada.

MISCELLANEOUS

FLYING Saucer Model $2, Walkie-Talkie $39.95, Checkwriter $29.95, Tweco, 155 Indio, Calif.

AUTHORS! Learn how to have your book published, promoted, distributed. Free booklet "ZD," Vantage 120 West 31 St. New York 1.

FREE! New 1960 catalog of all photographic books available. For your copy, send postcard with name and address to Catalog, Popular Photography Book Service, One Park Avenue, New York 16, N. Y.

DIESEL injector parts and fuel pumps wanted GM-51-53-71-110. Will, 2093 East 19th Street, Cleveland 15, Ohio.

TAPE Recorders, Hi-Fi Components, Sleep Learning Equipment, Tapes. Unusual Values. Free Catalog. Dressner, 69-02B, 174 St. Flushing 65, N. Y.

ELECTRO-Scribe! Engraves all Metals, $2.00. Beyer Mfg., 10511-ZD Springfield, Chicago 43.

FUN gifts and jokes galore. Catalog 10¢. Greenland Studios, Miami 47, Florida.

LEASE cottages. Terrace Ranch. Ph. 940. Box 99, Jackson Hole, Wyo.

BUY wholesale, send for free shop at home catalog today. Dixon Co., Box 836, Hawthorne, Calif.

MOVING?

Be sure **FLYING** follows you. Please send your change of address to **FLYING.**

CIRCULATION DEPARTMENT

434 So. Wabash Ave., Chicago 5, Ill.

HANGAR FLYING

NO NOTAMS

WHERE WERE WE? I did not know, except that we were roughly somewhere in the desolate mountain region of eastern Arizona.

Fifteen hours previous, my wife Nancy, a Kansas University law student, Charles Crawford, and I, departed Topeka, Kan., planning to reach Tucson, Ariz., in our rented Tri-Pacer, within 10 hours. At Amarillo, Tex., 30- to 40-knot headwinds put us six-plus hours behind schedule.

We arrived in El Paso, Tex., two-and-a-half hours before sunset. Impatient from the frustrating headwinds and eager to avoid as much mountain night-flying as possible, we departed El Paso International immediately after refueling. I filed our VFR flight plan via airways to Tucson Municipal while climbing to altitude.

The 227-mile route is broken into approximate fourths by three radio navigation aids, an omni station at Columbus, Tex.; LF-range station at Rodeo, N.M., at the halfway point; and Cochise, Ariz. omni at the three-quarter position. A quick check with El Paso radio gave favorable weather, except for increasing headwinds and reduced visibility.

In my haste I failed to check the local NOTAMS (Notices to Airmen). Had I checked them, I would have learned that two of the radio aids were not transmitting normally. Rodeo LF range was to be used as a homer only (we had no ADF) and Cochise omni station was off the air.

Upon reaching Columbus omni station 40 minutes after departure, our ground speed checked out at 92 mph, with a 30-degree crab to the right to stay on course. An attempt at cranking in Rodeo LF range produced nothing, but this gave me little concern as Columbus omni slipped behind us maintaining a fine signal. Visibility decreased steadily and soon we were flying over a thin carpet of dust.

Twenty minutes prior to our Rodeo ETA I still was unable to tune in the LF range. In the meanwhile, Columbus omni signal vanished from the omni receiver. Visibility was reduced, making visual fixes impossible. Once I picked up a busy tower operator's transmissions over my VHF. He continually failed to identify himself. Several blind calls in hope he might give us a VHF-DF steer brought no acknowledgments.

Our Cochise ETA arrived with sunset, but not Cochise. Fuel supply was two-thirds exhausted.

Then we got lucky. An air port beacon appeared out of the dense layer of haze and darkness below, and I altered course to head for it. It felt good when I made a low pass to see that we have found a landing strip in the mountain country.

Somebody finally noticed our efforts to be seen and runway lights came on as I started a long straight-in approach in extremely gusty air, to a touch-down at what turned out to be Safford, at the foot of the towering Graham Mountains in Arizona. We were 90 miles off course.

Now I am a faithful reader of NOTAMs.

JAY H. BUNDY

Jackson, Mich.

The COMEDY? of Errors

THIS INCIDENT took place as part of normal carrier-based aircraft operations off the Atlantic coast last summer. The recovery time was to be 1930, starting with TACAN, to the carrier-controlled (radar) approach. Several aircraft were airborne with a two-minute ETA separation. Three-zero had lost his DME but held bearing information. His radar operator reported "home plate" at 10 miles, bearing 090°, the same bearing indicated on TACAN.

Shortly thereafter CCA reported a target closing from 270° at nine miles, so the aircraft radar was secured. Base recovery course was given as 090° with weather information, for which three-zero "Rogered." As conditions were reported marginal, the pilot remained on instruments.

About this time the landing signal officer reported visual contact with an aircraft on final, but as a positive check, CCA requested 30 to flash his lights. It's surprising how much 30 can sound like 40 in the midst of a landing check list, so the inevitable happened—40 blinked his lights and reported "Meat-ball, props," indicating that his landing check list was complete and he saw the orange "meat-ball," giving glide-slope information. Upon reaching the "cut" position, 40 saw the green cut lights and effected a normal arrested landing.

As was to be expected, several people were surprised to see 40 instead of 30 on deck. Three-zero by this time had intercepted the glide-slope, made a normal descent and landing, but was out of communication with CCA, or anyone else. Three-zero came out of the arresting gear a little faster than usual, taxied a little farther than usual and then—saw some aircraft of different type than those based on our carrier. But then everything looks different after four hours on the gauges.

What had actually happened was that in this great big old Atlantic Ocean, two carriers 23 miles apart, were recovering aircraft at the same time on the same base recovery course. With no DME, but radar and TACAN bearing information agreeing, it was natural to assume that home plate was on radar. Upon descending to 500 feet, as directed by CCA, 30 lost UHF communications with the controller, but picked up the meat-ball. Since everything was normal except for the loss of communications, a landing was made on one of our super carriers—longer, wider, and the home of a different breed of mechanical bird. Had there been another aircraft at the same place and the same time, the results would not have been so humorous. So you think airports look alike? You should see two aircraft carriers in the middle of a big, inky, black ocean—*then* say which is home plate.

LTJG. R. B. JOHNSON

VS-39, F.P.O.
New York, N. Y.

BRIEFINGS...

(Continued from page 8)

1960–the 514th flew an impressive 4,745 accident-free hours. Furthermore, in the six years this unit has been flying the C-119 "Flying Boxcars," it has never lost an aircraft nor had a fatality as a result of an aircraft accident. Additionally, the 541st, in July of 1959, won both ConAC and 14th Air Force Safety Awards.

Midway tower controller Clyde Denham, (left) holds the 1960 "Controller of the Year" Award, coveted "Oscar" of the professional air traffic controllers, for his part, last June 22, in rescuing a private aircraft lost over Lake Michigan, 14,000 feet up in clouds, and short of fuel. Capt. Don

Aageson (right) TWA, airborne on a flight to New York, who worked with Denham, himself a private pilot, to effect the rescue, was cited for superb airmanship and teamwork with the ATC. Making the presentation is Frederick Davis, vice president, Air Transport Assn., which co-sponsored the ATCA awards.

Flying school teacher, Louise-Jean Wilson of Lansdale, Pa., is the 30th member of The Whirly-Girls, international organization of women helicopter pilots. The first woman in her state to receive a helicopter rating, Mrs. Wilson and husband James, conventional airplane pilots since 1957, trained for their helicopter ratings at the same time with Helair, Inc. at local Turner's Field. They are the sixth man-and-wife helicopter team in the free world.

Certificates of registration for any aircraft must now be displayed in permanent position either at the cabin door or cockpit entrance, according to new FAA ruling. The certificate must be so displayed as to be legible to crew and passengers. The new ruling (Part 5, Sec. 9) became effective October 19, last.

Under terms of a new contract, Lockheed Aircraft Services, Inc., will continue to operate and maintain the aircraft fleet of the National Aviation Facilities Experimental Center (NAFEC) at Atlantic City, N. J. The third NAFEC contract awarded to L.A.S. by FAA's Bureau of Research and Development, this one is in the amount of $1,133,000.

Several newly prepared examination test guides, prepared by FAA to assist airmen toward a desired certificate or rating are now, or soon will be, on sale at the U. S. Government Printing Office, Washington 5, D. C.; price 10 cents. Among these are a new supply of Private Pilot Test Guides; Flight Test Guide for Multi-Engine Class Type Rating (new); and three additional Guides for Commercial, Instrument and Flight Instructors' Ratings. A new International Flight Information Manual also is available on subscription basis, $3 per year.

Link Division of General Precision, Inc., has received an order from Eastern Air Lines for a third million-dollar flight simulator (Boeing 720) for crew training at its Miami base. This latest order brings Link's jet transport simulator sales total to 21, including those fer the Douglas DC-8, Convair 880, Lockheed Electra and Boeing 707 long-range jet transports.

Specialists in aviation management and technology, International Aviation Consultants, have opened offices in New York City at 60 East 42nd Street, under direction of Arthur C. Bass and F. L. Ricchi, executive associates. Comprised of a group of highly trained individuals with a wide background of aviation talents, backed by complete research facilities, IAC's comprehensive services include organizational planning, feasibility studies, operations, procurement, training, maintenance and service, airport/heliport development, insurance programming and public relations.

Marine Private 1st Class Donald L. Squires, Attack Squadron 311, El Toro, Calif. at 19 already holds a record that many pilots would envy, a flight time record of 1,850 hours. He's shown here strapping in 1st Lt. Allen R. Edens, squadron pilot whose

flight time totals 1,883 hours. Squires learned to fly in a Taylorcraft BL-65 and his first job as a pilot was for a crop-dusting firm in his home town, Little Rock, Ark. Private Squires does not intend to be grounded. He's applied for the Marine Aviation Cadet Program.

Thirty flying funeral directors from the U. S. and Canada, meeting recently in Denver, Colo., form the nucleus of the latest pilot organization on the American scene. Name selected: "Flying Funeral Directors of America." Officers elected are: Fred Bontrager, Coshocton, O., president; Jack Jerret, Toronto, Can., vice president; A. B. Eckersell, Rigby, Idaho, secretary-treasurer.

Elmo Maurer, executive pilot for Union Natural Gas Corp., of Tulsa, Okla. spends many of his off-duty hours giving aerobatic demonstrations about the country in his own airplane, without fee. For these and other contributions to air education, Pilot Maurer was feted at recent annual Tulsa

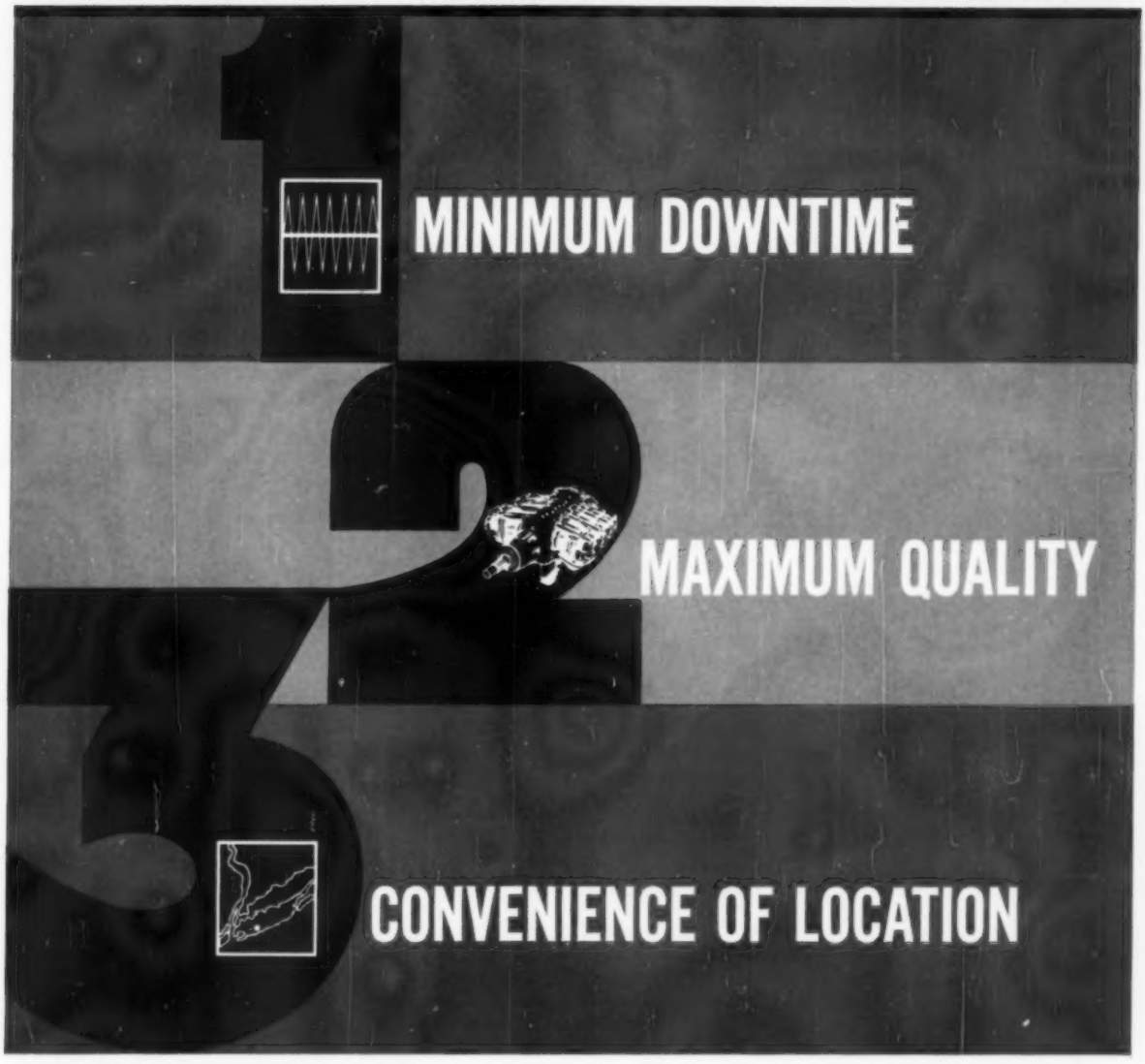
Flight Festival. Among many gifts from Tulsa aviation firms, was a model of an American Airlines' Boeing 707, presented by Maxine Newman (left), president of the "Chandelles" local woman's aviation club and Mrs. Dot Harkcom, wife of a Tulsa-based American Airlines' test pilot.

Texas realty firm now requires all new salesmen hired by the concern to have a pilot's license. Jim Fuller and Company of Conroe, Houston and Dallas, have found that light aircraft have so shortened the time necessary to show wide-spread listings over the state that the last three salesmen hired are pilots. Several of the older salesmen, along with the company president Jim Fuller, are pilots and other established members are being urged to complete their pilot training.

Around the world in 10 days. Carrying the colors of Hawaii to celebrate its first year of statehood, Pan Am jet pilot, Capt. Chuck Banfe, headed east from Honolulu last October 15th and circumnavigated the globe in a brand-new Bay Aviation Services Super-V light-twin. His stops on this first official round-the-world solo flight of a light-twin aircraft were: Oakland, Calif.; Battle Creek, Mich.; New York; Providence, R. I.; then Gander, Shannon, Rome, Beirut, Karachi, Calcutta, Bangkok, Manila, Tokyo, Wake Island and Honolulu, landing there on October 24th. On his "busman's holiday," Capt. Banfe carried messages of good will from Hawaii to each country in which he stopped. He reported no mechanical problems en route.

PRINTED IN U.S.A.

THREE REASONS TO TOUCHDOWN IN NEW YORK'S BACKYARD



RADIO SALES & SERVICE/*The east coast's finest aeronautical radio, sales, service and custom installation facilities . . . Distributors for Collins, ARC, Dare, Flighttronics, Lear, Narco. Service and facilities for all manufacturers including Bendix, Sun-Air, Wilcox, Sperry, etc. Producers of the new Systems Integrator® /TUrner 8-0010.* **DOT AIRTRONICS**

MAJOR OVERHAUL/*The finest in workmanship . . . guaranteed. Specializing in Continental and Lycoming engines. A complete line of parts stocked. New engine type warranty, labor done on flat rate. New and remanufactured engines available for exchange. Maximum quality . . . minimum downtime/MYrtle 1-1700.* **ISLAND AIRMOTIVE**

Amityville Flying School/*FAA approved advanced flight school, specializing in instrument and multi-engine ratings. Part time or accelerated courses; private, commercial, flight instructor, business pilot, helicopter, radio navigation. Piper sales and service.*

HARD SURFACED RUNWAYS 4200'/ADF INSTRUMENT APPROACH/TELETYPE/ROTATING BEACON/FAA OFFICE/DIRECT LINE TO ATC, ATCS, IDL/UNICOM/ RUNWAY LIT ALL NIGHT/HERTZ CARS/MOTEL/FINEST IN FACILITIES FOR MAJOR OVERHAUL/SALES AND SERVICE IN AERONAUTICAL RADIO

GULF
Gulf aviation products

Long Island, New York/AMityville 4-4200

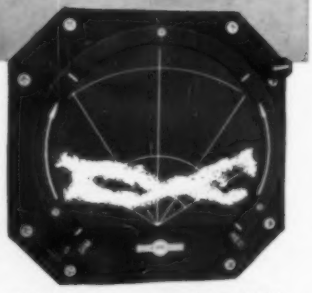
ZAHNS AIRPORT

New lightweight weather eye for business aircraft

FULL SERVICE AT HALF THE WEIGHT

Collins transistorized WP-103 Weather Radar System weighs only 48.8 pounds. New low volume and power requirements make the WP-103 the best buy yet. And Collins modular construction simplifies maintenance. The WP-103 has a new, fully stabilized antenna available in 12″ or 18″ dish to fit any space requirement.

Accurate, continuous picture of weather conditions 150 nautical miles ahead of the aircraft in a 120° sweep, ±15° tilt . . . a special Iso Echo contour feature clearly defines corridors of milder weather, and sharp, black areas of intense activity. A new bright tube, daylight-type indicator needs no cumbersome scope hoods.



Let Collins give your aircraft a new lightweight weather eye — the WP-103. Contact your nearby Collins Distributor, or write Collins direct for further information.

COLLINS

COLLINS RADIO COMPANY • CEDAR RAPIDS, IOWA • DALLAS, TEXAS • BURBANK, CALIFORNIA